Joint Engagement in Children with Autism

Assessment of children with autism in free-play with mothers and preschool teachers

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This study is based on data from the study "Effect of joint attention intervention for young children with autism – a randomized controlled trial" at Oslo University Hospital, Child and Adolescent Mental Health Research Unit and Centre for Child and Adolescent Mental Health, Eastern and Southern Norway.

I am indebted to the owners of the data and thank them for letting me use parts of the extensive material that have been collected. Also I would like to give a special and warm thanks to all the children, parents, and preschool teachers that participated in the study.

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Abstract

Main Purpose

The main purpose of this thesis is to investigate how children with autism aged 2–4 play with their mothers and preschool teachers, and whether there are differences between the mother-child dyad and the preschool teacher-child dyad. The focus of this study is aspects of social development in children with autism.

Theoretical perspectives and research questions

The main theoretical foundation lies within the boundaries of the transactional perspective. Within this perspective, socio-cultural theory and cognitive theory have made major contributions to the understanding of social development in children with autism. Relevant research will be presented to support and discuss the different theoretical account. This will in turn be seen in the light of transactional processes.

The research questions in this thesis are as follows:

Research Question 1:

Are there differences in duration of joint engagement between mother-child and preschool teacher-child dyads?

Research Question 2:

Are there differences in the frequency of *positive affect, expansiveness, change of object-focus*, and *language* between *and* within the dyads mother–child and preschool teacher–child during joint engagement?

Research Question 3:

Is there a relationship between the variables *positive affect, expansiveness, change of object focus*, and *language* within the dyads?

Method

This study build on data from a randomized controlled trial investigating the effect of a joint attention intervention for young children with autism at Oslo University Hospital, Child and Adolescent Mental Health Research Unit and Centre for Child and Adolescent Mental Health, Eastern and Southern Norway. In the present study a sub-sample of 53 children (aged 2–4) already diagnosed with childhood autism were included. The children were filmed during 10 minutes of free-play with their mothers and preschool teachers.

The recordings were scored using a coding paradigm, developed by Bakeman and Adamson (1984), assessing different mental states of engagement for the dyads. Using the data from this coding paradigm, two of the mental states that predict positive developmental outcomes were then chosen to assess the amount of certain factors that may be of importance to prolong such states. These states make up the variable called joint engagement. The variables were: positive affect, expansiveness, change of object focus, and language. The author, in collaboration with the principal investigator of the larger study, developed exhaustive coding guidelines for all variables. Two independent raters coded positive affect, expansiveness, and change of object focus. The author scored the language variable. All the variables were scored using frequency measures.

Statistical analyses: Quantitative comparative correlation analyses and t-tests were conducted, in order to look for trends and differences both for individual and dyadic contributions.

Results and conclusions

The results showed that the preschool teacher-child dyad spent significantly more time in joint engagement than the mother-child dyad.

Positive affect, expansiveness, change of object focus, and language did not seem to give any clear support to whether these variables contributed to the difference found for duration of joint engagement. However, the similarity between the frequency distributions for the mother

and preschool teacher can be seen in line with a transactional perspective. Further, one more finding in this study supported the transactional view, namely that the children's scores on all variables correlated across the two dyadic conditions.

The target variables showed a high degree of similarity across the two studies. Moreover, some interesting results were found when exploratory data analyses were conducted for the two dyads. These analyses showed that the mother-child dyad correlated with each other in amount of positive affect, expansiveness, change of object focus and language. Although the same was found for the variables expansiveness and change of object focus in the preschool teacher-child group, the correlation between language and positive affect did not reach significance. Further, a significant negative correlation was found between preschool teacher's positive affect and the child's expansiveness, change of object focus, and language.

Forord

Jeg vil takke Stein Erik Ulvund og Lars Smith for god veiledning gjennom hele prosjektet. Takk til Thor Arnfinn Kleven for gode innspill i forhold til metode og statistikk. En stor takk til Eivind Solfjell for meget grundige og omfattende gjennomlesninger av oppgaven. Takk også til pålitelige Cecilie Næss og Caroline Ulvund som har arbeidet spesifikt med kodingen til dette prosjektet.

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Sist og aller mest vil jeg takke min sønn Fabian, min største inspirasjon og motivasjon i fem år!

Oslo, 25.11.10,

Anders Johan Nordahl Hansen

Table of contents

1 Introduction

1.1 About the study

The purpose of this thesis is twofold: to investigate factors in the dyadic interactions between adults, and children diagnosed with autism; and to compare the differences in the social interactions that children with autism have with their mother, to the interactions these children have with their preschool teacher.

1.2 Definition of core terms

One of the core terms in this thesis is "joint engagement", which can be defined as two people's active involvement with each other whilst coordinating their attention between the other person and the object at hand (Bakeman & Adamson, 1984). Joint engagement is closely related to the term "joint attention", and both have been documented to affect various kinds of developmental domains. Joint attention can be defined as "…skills that involve the referential triangle of child, adult, and some third event or entity to which the participants share attention" (Carpenter, Nagell, & Tomasello, 1998, p. 1).

Although the definitions of joint engagement and joint attention may be difficult to disentangle at first glance, they address different aspects of what can more broadly be termed as interconnectedness. In the definition of joint engagement, the word *involvement* creates an understanding that this is a mental state shared by two individuals that lasts over a period of time. Joint attention, although addressing some kind of interconnectedness between two individuals, also appears in the form of non-verbal communicative behaviours such as gaze-alternations, giving, showing, and pointing. Within the research domain, these terms are operationalized differently. Joint engagement is measured in terms of duration, whilst joint attention is measured in terms of frequency.

Traditionally joint attention and joint engagement have been investigated in relation to language development (Siller & Sigman, 2008). However, in the past decade researchers have started focusing on other developmental domains that may be connected to these two terms (Kasari et al., 2010). Even though investigations addressing joint engagement and joint attention have been going on for the last three decades, there are still many questions that need to be answered.

1.3 Theoretical backdrop

In the past decades, there has been a shift towards a more holistic understanding of childhood development through the scope of dynamic system theories – holistic in the sense that many researchers have acknowledged the extreme complexity of developmental processes and the multitude of factors in almost all instances affecting a child's developmental path (Sameroff, 2010). Consequently we have seen many researchers embracing more complex theoretical approaches to the understanding of development. One model focusing on the multitude of various factors is the transactional model of development. This perspective is an appropriate approach to understanding a condition as complex as autism.

1.4 Development in autism

Children with autism show severe difficulty and impairments in joint attention, and the ability to join with others in states of joint engagement. These children are thus by far the most studied group concerning these specific aspects of development. The research within this tradition has focused on various aspects of the origins, mechanisms, and possible developmental influences as a result of high or low functioning joint attention skills and/or high/low ability to participate in joint engagement with other persons.

1.5 Overall composition

1.5.1 Autism

In the second chapter of this thesis, a general presentation of autism will be given. First, some historical aspects of autism are presented, followed by a section on diagnostic criteria of the diagnosis. Then a section focusing on epidemiology will be given, especially focusing on the increase in the amount of children diagnosed with autism during the last 20 years. Symptoms and detection of autism are closely related and will be presented before the causes for the disorder are discussed.

1.5.2 Theory

The main theoretical framework for the thesis will be presented in chapter three. Using transactional models is today considered an important approach that can deal with the complexities of childhood development in ways that reductionist models cannot do. In this chapter, important aspects of the transactional perspective are explained and exemplified, both in relation to typical development and to development in children with autism.

The fourth chapter considers the domain of childhood social development in general. Here, topics important for understanding social development in autism are addressed. First, a consideration of aspects concerning what is normal development as opposed to abnormal or non-normative development will be presented. Second, a short section on early social development is given, before different aspects relating to social cognition are discussed.

The main purpose of chapter five is to present joint engagement, the main theoretical term of this thesis. However, because of the close relationship between joint engagement and joint attention, the latter term will be presented before the former. Theory and research considering

typical development will be addressed, and an explanation of how these terms are operationally defined and measured will be offered.

Chapter six will specifically focus on developmental aspects in autism. Relevant theoretical accounts, such as socio-cultural theory and cognitive processing models, will be discussed in light of research on joint attention and joint engagement. The last part of this chapter will discuss the importance of free-play for development.

1.5.3 Variables, research questions, method and results

In chapter seven, the variables under scrutiny in the thesis are presented. These are the duration variable *joint engagement*, and the four frequency-variables *positive affect, expansiveness, change of object focus*, and *language.*

Chapter eight postulates the three research questions, whilst chapter nine contains aspects relating to the method used in the thesis. Here there will be a description of the participants that make up the sample, and choices of statistical measures. Also a summary of the coding schemes will be given a brief presentation. Further, tables summarizing the inter-rater reliability of the coders will be presented.

The results will provide the basis for chapter 10, with written descriptions, tables, and figures.

1.5.4 Discussion

Chapter 11 consists of a discussion on the findings from the study. In the first part of this chapter, problems concerning method and methodology will be put forth before some limitations of the study are raised.

Each research question will be discussed separately. This will be done considering the theory section of the thesis, and especially discussing the results in light of the transactional perspective.

In chapter 12, some concluding remarks will be presented, followed by a final section considering suggestions for future research.

2 Autism

Autism spectrum disorders (ASD) is a group of neuro-developmental disorders characterized by impairment in social behaviour and language, restricted interests, and repetitive behaviour (Levy, Mandell, & Schultz, 2009). ASD can be seen as a heterogeneous group of disorders. The level of severity considering the core symptoms differs greatly, and children belonging to this group may be found at all levels of intelligence and language ability (Geschwind, 2009).

2.1 Brief historical perspective

Autism as a term portraying children with specific characteristics was first used by Leo Kanner, in a seminal clinical description of 11 young boys and girls that were patients at his clinic (Kanner, 1943). Since then there have been discussions and controversies concerning what the causes for this particular disorder or syndrome might be. There has also been a debate as to what constitutes the main symptoms of autism. The controversies and discussions that have been going on for over 60 years have contributed to different ways of understanding and viewing autism.

Below, the causes, symptoms, and prevalence of autism will be outlined. But first the variation in usage of the term autism, and how autism relates to other disorders, will be presented.

2.2 Diagnostic criteria

Autism, or autistic disorder is classified under the collective term pervasive developmental disorders (PDD) in both the 10th version of the *International Classification of Diseases-10* (ICD-10 World Health Organization, 1993) and the *Diagnostic and Statistical Manual (*DSM-IV-R, American Psychiatric Organization, 2000). In addition to these diagnostic manuals, researchers and practitioners operate with the term autistic spectrum disorders (ASD) that refer to a broader category than the term autistic disorder. ASD refers, alongside with autistic

disorder, also to Asperger syndrome and the more vague category called pervasive developmental delay/disorder not otherwise specified (PDD-NOS) (Levy, Mandell, & Schultz, 2009). During the last few years some researchers have argued that the term autistic spectrum disorder does not offer a comprehensive description of all individuals within this cohort. Baron-Cohen (2003) argues that the word disorder should be substituted with the word condition to do justice to more of the people within the autistic spectrum. The argument is that despite a lower level of social skills, many show good and even above average skills in non-social tasks (Baron-Cohen, 2008).

There have been various changes in the diagnostic criteria and categorization of autism over the past decades. As is often a problem with psychiatric disorders, the criteria that must be met are embedded in symptoms and cognitive phenotypes (Geschwind, 2009). Many of these symptoms and phenotypes are not just belonging to the ASD spectrum but can be found in other diagnoses as well, often leading to misdiagnosing. In many cases there is co-morbidity with other types of diagnoses, which may contribute to obscuring the ASD diagnosis (Hill & Frith, 2003; Levy, Mandell, & Schultz, 2009).

Despite these difficulties, there is consensus around the core deficits in the diagnosis of autism. The consensus concerns the troubles people with autism have in reciprocal social interaction (Geschwind, 2009). Although some changes to the criteria in the forthcoming DSM-V have been proposed, the reciprocal social interactional and communicative aspects remains a central aspect of the diagnosis. A return to these symptomatic aspects will be presented after a short review of the causes and epidemiology.

2.3 Epidemiology

Autism was earlier viewed as a rare disorder. For instance, in Norway the prevalence of autism, based on numbers from administrative registers in 1989, was less than 2 per 10 000 (Sponheim & Skjeldal, 1998). There are few recent studies in Norway focusing on prevalence of autism. However there are many studies conducted in the US and the UK that give an overview of recent trends in the prevalence of autism. All these studies show a dramatic increase of the disorder. Figure 2.1 shows the number (per 1000 children aged 6-11) in the US

with a diagnosis of autism from 1996 to 2007. The figure is collected from the Wikipedia and reprinted in Baron-Cohen (2008), and as with other material that is not peer-reviewed caution to the validity must be taken. However as Baron-Cohen notes, “there is no real dispute over the fact that the rate of diagnosis of autism spectrum conditions has massively increased” (Baron-Cohen, 2008, p. 26).

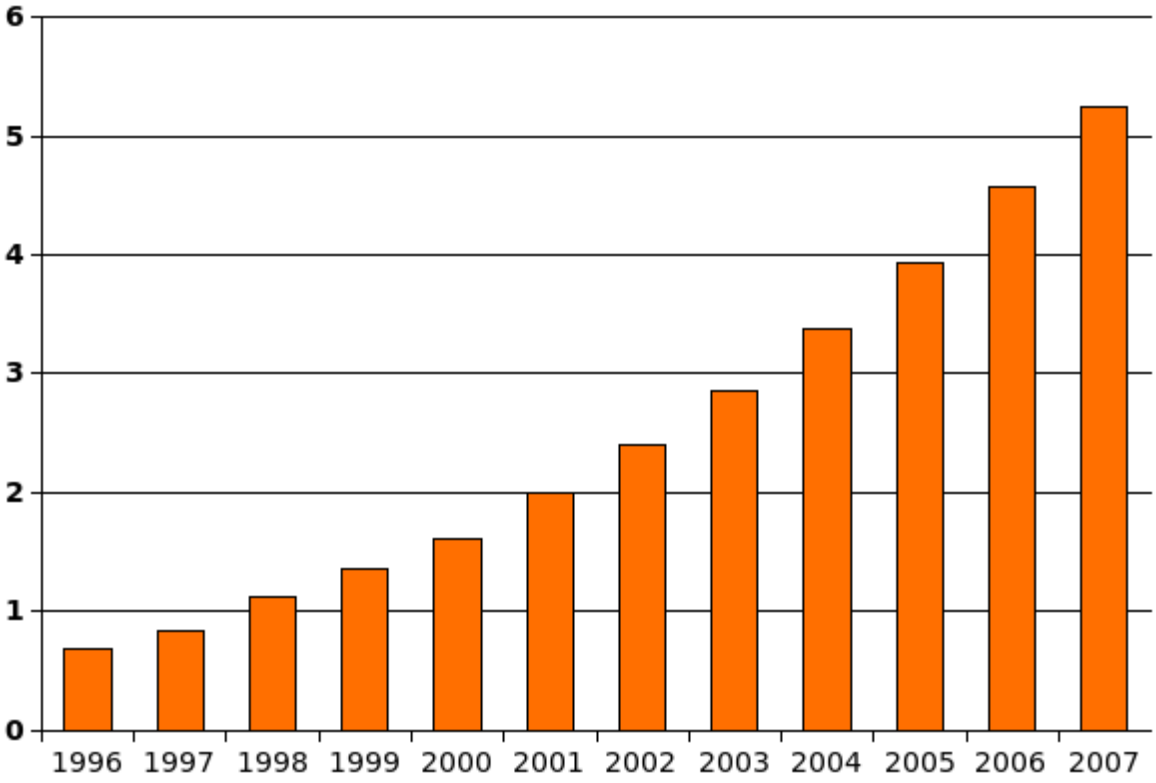


Figure 2.1. From Baron-Cohen (2008)

As we se from figure 2.1, the increase in prevalence over the last two decades have been dramatic. As the figure shows in this particular instance, an estimate of approximately 5 per 1000 children was diagnosed with autism, however recent prevalence studies report even higher numbers of children with autism in the population. Some prevalence studies report a prevalence of 72 per 10 000 children with an autism diagnosis (Levy, Mandell, & Schultz, 2009). In some parts of the UK the prevalence have been reported to be as high as 157 per 10 000 children when controlling statistically for unknown cases (Baron-Cohen et al., 2009; Fombonne, 2010). Recent reports from the U.S. estimate that 1 in every 110 children (1 in

every 70 boys, 1 in every 315 girls) may have a diagnosis within the autistic spectrum, making it one of the most common developmental disorders (Lord & Bishop, 2010).

The differences between the numbers presented in various findings may be explained by how autism is defined. Some studies focus on the whole autistic spectrum (ASD), while others define autism more narrowly (e.g. autistic disorder). Even so, the extreme increase in cases of children with autism has led many to claim that environmental factors cause autism (such as diets, or MMR vaccines). A more plausible explanation for the increase in prevalence of autism is that people working at public health centers, in schools, kindergartens, or clinics, etc. are becoming increasingly aware of autism as a diagnosis, leading to more cases being detected. The development of diagnostic tools such as the Autism Diagnostic Observation Schedule (ADOS) and the Autism Diagnostic Interview (ADI) (Lord et al., 2000) and others have lead to better screening possibilities. Moreover, a cumulative body of research focusing on developmental markers and trajectories has led to important insights that have helped detecting not only more cases, but also at an earlier age.

2.4 Detection and symptoms

Several intervention programmes concerning autism report positive development in many domains. One major insight is that the relative success of treatment is strongly linked with early intervention (Volkmar & Charwarska, 2008). Thus, age of detection becomes important, as it can create the opportunity for intervening at the earliest age possible. Even though many of the skills mastered by children developing typically are absent already in the first year in children with autism, the diagnosis is usually not given to a child before reaching the age of two (Charman & Baird, 2002). One reason for this may be that as much as 20 % of children diagnosed with autism may in their first two years in many respects develop within what is seen as the average range of normality (Rogers, 2004). This may mask the deficiencies these children have in certain skills.

Some researchers have started to investigate various biological markers such as urinary metabolism (Yap et al., 2010), and have detected differences between children that later were diagnosed with autism and other groups. Other studies have investigated differences in hormonal levels. For instance, Baron-Cohen, Lutchmaya, and Knickmeyer (2004) found that prenatal testosterone levels were higher in children that later were diagnosed with autism compared with those who did not get such a diagnosis. However, the findings of early biological markers need to be replicated before valid conclusions are made.

The search for biological markers is still in its initial stages. The use of such methods to screen for autism is not seen as part of clinical approaches and will probably not be used in the near future. Today the screening processes rely on behavioural and cognitive measures. Most diagnostic tests, such as the ADOS and ADI, Vineland Adaptive Behaviour Scale (VABS) and Modified Checklist for Autism in Toddlers (M-CHAT), are used in addition to clinical assessments. These diagnostic manuals focus on the three problem areas of autism. The revised fourth edition of the DSM-IV lists these deficit-areas as problems in reciprocal social interaction, communication, and restricted repetitive interests and behaviours (American Psychiatric Association, 2000). The proposals for the new DSM (DSM-V) will put larger emphasis on these domains. However, the section focusing on reciprocal social interaction and communication problems will probably, as proposed, be merged into one domain describing severity in social communication (Lord & Bishop, 2010).

As mentioned earlier there has been a large increase in the prevalence of autism. This is partly because the diagnosis now includes individuals at all levels of language ability and intelligence. Autism is thus no longer a marginal disorder (Hill & Frith, 2003). Although this makes the group of people with this disorder more heterogeneous, there are certain behavioural aspects that stand out as potent markers. One such marker is the relative ability to establish joint attention (Charman, 2003; Mundy, Sullivan, & Mastergeorge, 2009; Toth, Munson, Meltzoff, & Dawson, 2006). Another marker belonging to the social communicative realm is the problem children with autism have in engaging in social interaction (Levy, Mandell, & Schultz, 2009). As a diagnostic tool, both joint attention and social engagement deficits are important in both research and clinic. However, deficits in these two areas are

most often detected after the first twelve months. This has lead researchers to deploy other methods to detect abnormal or non-normative behavioural developmental trajectories within the first year of life.

One line of research bent on facilitating early detection of markers in autism within the first year of life has proposed the use of eye-tracking devices to look for abnormalities in face recognition. Especially studies conducted at the Yale Early Social Cognition Lab report that children with autism already in the first few months of life have an abnormal way of looking at faces. This defect in infants with autism is hypothesized to be associated with a difference in the mental mode of processing faces. These patterns of face processing are different from infants developing typically and infants with other non-autistic developmental disorders, suggesting a disruption in deeper processing of highly socially relevant stimuli (Chawarska, Volkmar, & Klin, 2010).

As we can see, there are a number of important studies conducted concerning early detection of biological and behavioural markers. The two psychological and behavioural aspects that will be presented later focus specifically on joint attention and joint engagement in children with autism. Nevertheless, the work from for example the Yale-group on early face processing can be viewed in accordance with both joint attention and joint engagement.

2.5 Causes of autism

Historically, a number of theories as to the cause(s) for autism have been suggested. Some of these theories have contributed to better understanding, screening processes, and interventions. Some theories however, have done more wrong than good: One claim was that parents that did not show enough affection, or was what could be characterized as “cold” caused autism. This view, as proposed by for example Bettleheim (1959), followed the hypothesis originally discussed in Kanners article (1943), that autism was a kind of psychosis resembling a type of childhood schizophrenia (Geschwind, 2009). Parents of children with autism may or may not be viewed as “cold”. There is no research suggesting that the parents

are causing autism in their child in this manner (Rutter & Bartak, 1971). Even so, some parents may be viewed as "colder" in their interaction with their child with autism. This however, may be because of the child's difficulties in interaction rather than the other way around.

Some claims have been made about the relation between the MMR-vaccine and autism. The rationale behind this claim is that there seems to be an increase in the prevalence of autism where there has been an increase in children who get the MMR-vaccine. This claim builds upon mere correlation between these two factors. By serious researchers it is the common view that it is purely incidental that the fact that MMR-vaccines became available to all children in most of the western world at approximately the same time as there were an increase in the prevalence of autism. As to date there are no studies with scientific rigor supporting that MMR-vaccines cause autism in any way (Baron-Cohen, 2008; Geschwind, 2009).

Another lobbying group claim that the mercury base found in other childhood vaccines that cause autism. The group claims that children with autism have a genetic inability to secrete the mercury that we all are exposed to. This toxin is allegedly carried in the bloodstream to the brain and accumulates there (Baron-Cohen, 2008). The study that give support to the claim of mercury as being the cause for autism is at best, scientifically speculative.

Although there is to date no evidence supporting causative factors such as the MMR-vaccine, other environmental factors cannot entirely be ruled out. However, the possibility for an environmental factor being the single contributor for autism seems unlikely. Nevertheless, research conducted by Fombonne (2008) and others suggest that there may be environmental factors contributing to the massive increase in the prevalence of autism, and that this increase cannot only be attributed to more awareness, diagnostic aspects, and better detection methods.

There is no consensus as to what is the main cause of autism. Many argue that assuming autism has only one cause does not make any. There may be good reasons to take this as a point of departure. ASD is a broad category, and there may be subgroups belonging to the spectrum but still having a distinct range of causative factors. If so, this adds yet another level to the complexity of the autism riddle. However, research is currently underway giving support to some causational factors. One of these, linked to ASD, is found in genetic components (Abrahams & Geschwind, 2010; Levy, Mandell, & Schultz, 2009). For instance, recently, researchers have identified high paternal age as a risk factor for ASD (Geschwind, 2009), although it should be noted that this line of research is preliminary and needs further investigation. Even though ASD is seen as being chiefly hereditary, they acknowledge the intricate ways genetic factors play both in a gene-gene and a gene-environment interaction (Levy, Mandell, & Schultz, 2009).

The acknowledgement of the interplay between genes and environment fits neatly into transactional models of development such as that of Sameroff and Chandler (1975). The transactional model takes a multifaceted perspective on development, and thus works very well as a theoretical framework when addressing a complex disorder such as autism.

3 Transactional models of development

A historical rough-sketch of the science of development is by many summed up as a pendulum swinging between empirical advances in either nature or nurture. The studies of ethology, cognitive science, and behavioural genetics were during the 1960s and 70s focusing on nature. The shift turned to nurture through for example social ecology and social deconstruction in the 80s and 90s. During the 2000s', the shift in developmental science was driven by research in molecular biology and neuroscience (Sameroff, 2010).

There are still to a certain degree shifts between nurture and nature issues in developmental science. However, the understanding of development as a result of multiple factors affecting each other in intricate interactions became, during the last part of the twentieth century, a popular approach to child development. Multi-factorial models combine aspects traditionally labeled under either a "nature" or a "nurture" category. One such interactional model is the diathesis-stress model. In this model, a disposition for a specific disease (diathesis) will only lead to a disorder if the individual is exposed to certain kinds of stress (Ulvund & Smith, 2004). In these models, there is a clear emphasis on the interaction between nature and nurture. Even though interaction models have had a large impact on how we how development is viewed, some researchers have criticized these models for lacking a dynamic dimension. One such critique comes from Sameroff and Chandler (1975). These researchers added the component of time to the existing interaction models, ending up with a transactional model of development, and thus making it more dynamic. This model embraces the thought of interactions between various factors, but also views these factors as interacting over time. In Sameroffs own words, "The infant is effecting his caretaking environment at the same time that the caretaking environment is effecting the infant" (Sameroff, 1975, p. 67).

Figure 1 below gives an example of a developmental path using the transactional model. Here we see how the child's birth complications lead the mother to experience anxiety, which may in turn affect the child's temperament in a negative manner. The child's temperament can cause the mother to withdraw herself from the child, or perhaps avoid situations she expects

will lead to particular difficulties. Further, the mother's avoidance may lead to a lack of appropriate social interaction, which in turn may affect the child's language development.

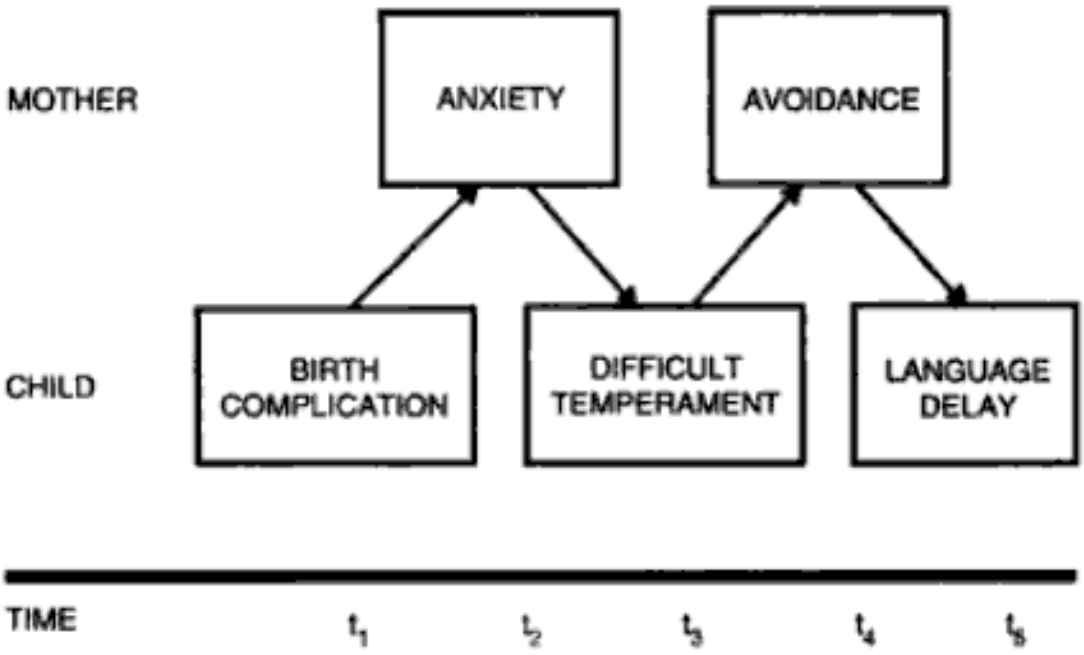


Figure 3.1. Printed with permission from Arnold Sameroff (from Sameroff & Fiese, 2000)

According to Smith, taking a transactional perspective on development means making some basic assumptions. One assumption is that children themselves contribute to their own development by actively organizing their experiences. Also, the interaction between a child and its primary caretaker is seen as a two-way relation affecting both participants. Another basic premise is that the characteristics, regardless of whether they originate in the child in the environment, are not static, but must be seen as over time regulating each other reciprocally (Smith, 2010).

The transactional perspective proposed by Sameroff and Chandler should be seen as complex because it takes into account more factors in both the environment and the individual. It also

has an advantage compared with other interactional approaches because the time aspect adds a more dynamic element to the model.

A strength of the transactional model lies within the fact that the model views development as multi-factorial. Many studies point out that a developmental path rests on several factors (Sameroff & Fiese, 2000). Such studies support the notion that when speaking of risk factors there usually is not just one main causative factor or effect that leads to normal or abnormal development. Factors play together over time in a reciprocal manner. The model is based on the view that most children's developmental paths can be changed. The transactional model has also a holistic perspective. A view that incorporates this holistic understanding of social partners affecting each other is a good starting point for interventions. Considering the relational aspects between individuals may work as prevention and protection during the course of development, and is a strong asset of this theoretical framework (Smith, 2010).

3.1 Two examples of transactions in development

The points made above, stressing the importance of relational qualities and their role in development, can be exemplified by research on temperament by Thomas and Chess (1987). They made categories such as "good", "bad", or "slow to warm up" to describe different temperaments in babies. Although they received critique for the implicit normative sound of the categories, they later emphasized that the temperamental disposition characterized as "bad" is not necessarily so. It all depends on how the child's temperament is viewed and responded to by the environment, and how the child responds to these influences. They called this "goodness of fit". Thus, when a child has a "bad" temperament, this is not necessary a bad thing if the caretakers see it as for example an active child instead. The goodness of fit, i.e. the matching of persons, is of importance for development. This is one example of how individuals can shape and themselves be shaped reciprocally.

Another example of the transactional process comes from Mundy & Neal (2001). These researchers proposed that the core deficits in joint attention and social orientation in children

with autism affect later neural plasticity. The impact on the neural plasticity is in turn hypothesized to contribute to weaker social information processing, leading the child with autism to further deviate from the path of typical development (*Fig. 2*).

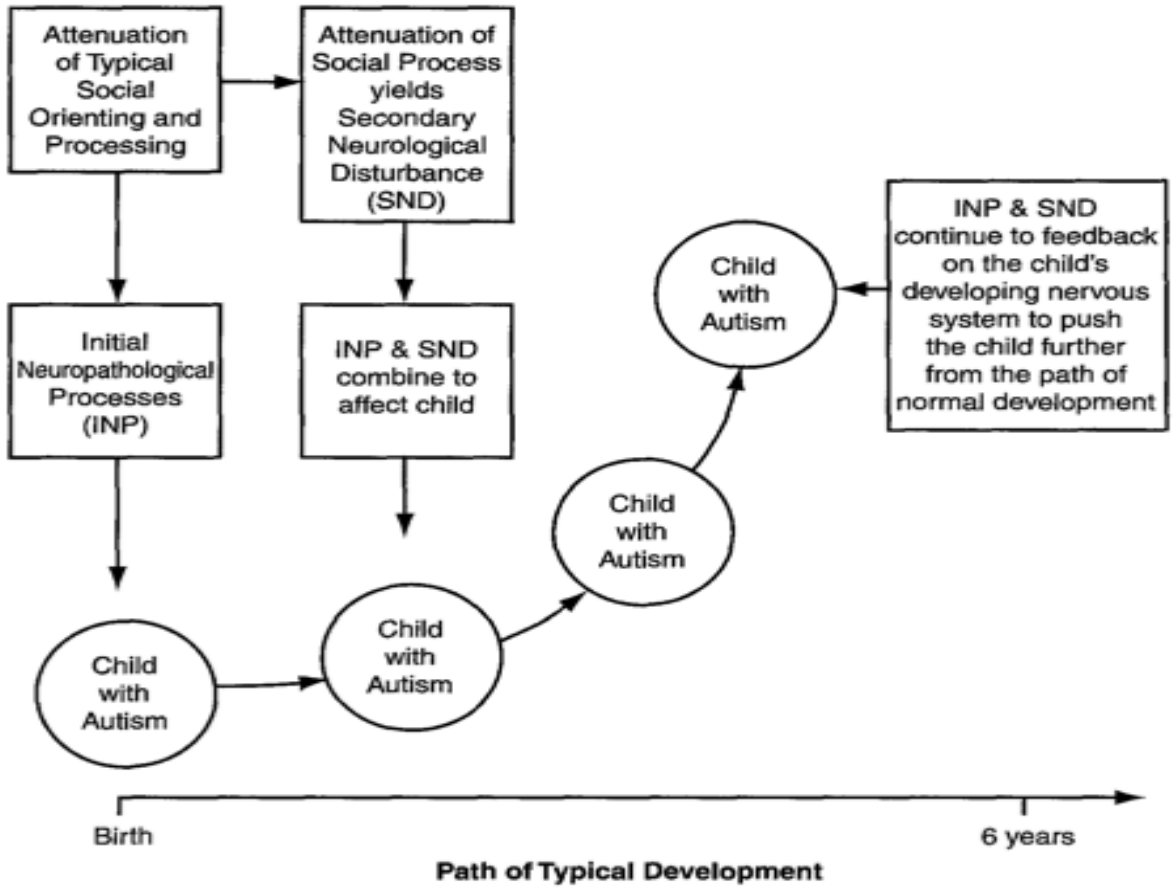


Figure 3.2. Printed with permission from Peter Mundy (from Mundy & Neal, 2001)

This figure also shows how initial neuropathological processes already from birth puts the child with autism in a different line of development than children developing typically. This atypical development will be further accentuated by negative feedback from the difficulties in social orienting, which in turn attenuates the secondary neurological disturbance (Mundy & Neal, 2001). A result of these attenuations is hypothesized to affect neuroanatomical development in autism. This is a good example of how transactional processes may not only work in a straight line from biology to social functioning, but as a biological-social interaction

over time. In line with the claim made by Smith (2010), Mundy and Neal argue that the child's own contributions to its development are important.

3.2 The complexity of development

Sameroff claims that the time of the reductionist developmental models has come to an end (2010). Unidirectional models are being substituted with multidirectional. The new models of multiple directions and factors are of course more complicated than the reductionist models. A critique of the transactional model might be that the principles of Occam's razor of making the fewest assumptions necessary are not being adhered to. In defence of the transactional model Sameroff writes "Although we have a strong desire for straightforward explanations of life, development is complicated and models for explaining it need to be complicated enough to usefully inform our understanding" (Sameroff, 2010, p. 20).

Considering autism, the complexity of development seems particularly true considering what we know today. The fact that different types of interventions have effect on various developmental trajectories shows that although biological factors play an important role, environmental factors contribute to a large extent. For instance in the example above, Mundy and Neal find support for the hypothesis that interventions targeting joint attention skills could make the child deviate less from the typical path of development (Mundy, Gwaltney, & Henderson, 2010; Mundy & Neal, 2001).

The following chapter will address some of the factors seen as highly important in general development. These factors can be neatly fitted into a model of transaction. The factors that will be addressed are joint attention and joint engagement. Children with autism show severe difficulties in initiating and responding to joint attention and participating in joint engagement. This underlines the importance these two aspects play in development, particularly when focusing on children with autism.

4 Social development

4.1 In light of normal development

To completely understand what can be called atypical, abnormal, or perhaps non-normative development, it is important to know what the opposite of such development would be. In developmental theories, it is common to portray normality in accordance with trajectories or developmental paths as opposed to atypical patterns. As mentioned earlier, one of the core deficits in children with autism relates to social interaction. Several aspects concerning this group in relation to social development have been investigated. One of these aspects concerns the ability to empathize. This line of research gives support to the notion that children with autism have difficulties understanding other people's minds (i.e. theory of mind or mindblindness, Baron-Cohen, 1997). The development of a theory of mind occur somewhere between the ages of three to five years in typically developing children (Wellman, Cross, & Watson, 2001). In children with autism this ability to "mind-read" appears significantly later, or in some cases not at all (Baron-Cohen, 1997). Joint attention and joint engagement, sometimes viewed as precursors for a theory of mind (Tomasello, 1995; Yirmiya et al., 2006), are highly investigated areas of interest when addressing children with autism and their difficulties in relation to social interaction. In this chapter, these two terms will be thoroughly explained. Joint attention and joint engagement will first be explained in general terms and with focus on how processes relating to the terms unfold in typical development. Second, research and theoretical aspects of joint attention and joint engagement will be presented, with a main focus on joint engagement.

4.2 Early social development

An infant is already in its first few months joining in social interaction with others, primarily with its caregivers. These early social interactions, often called face-to-face exchanges, are typical for the first 6 months or so (Meltzoff & Decety, 2003), and work as a gateway into more complex exchanges occurring later in a child's life. According to Trevarthen and

Hubley (1978) this can be seen as the child's primary experience of intersubjectivity. After this face-to-face period, a transition starts (Ulvund & Smith, 2004). In this transition the infant, to a larger extent, begins to take an interest in objects rather than interacting socially. This period of object focus usually declines when the child is approaching the end of the first year. In the following phase the child begins to coordinate its attention to objects and to their adult caregivers, and the object-focused attention becomes embedded in a social context. This is called a triadic engagement between child, caregiver, and an event or object (Bakeman & Adamson, 1984). Many see this period as an important milestone for the development of social cognition (Charman, 2003; Smith, 2002; Tomasello, 1995). It is near this first year that typically developing children start to show intentional behavioural skills, skills that many indicate an intention on the child's behalf to want to share experiences and objects with other persons.

4.3 Social cognition

Research discussing the role joint attention and joint engagement play in social cognition is concerned with how children conceptualize oneself and others (Dunham & Moore, 1995). Core questions are *when* and *how* a child understands that it is participating in interactions that have a joint or shared focus towards objects or events. It is important to acknowledge that even though a child has established attention skills or participates in reciprocal bouts of play, it does not necessarily imply that one can ascribes to the child the capability to understand that others have a different psychological state than their own. Some researchers claim that this state is not acquired before well in to a child's second year. For instance, Trevarthen's theoretical account proposes that children approaching their first birthday already have a secondary intersubjectivity. This theory interprets the emotional responses in infants from 9–12 months as an ability to share a mental focus on objects and events with others (Trevarthen, 1979). In contrast, Baldwin suggests that these emotional responses might as well be interpreted as a child's feeling of joy when understanding that it can control other peoples' actions, making the emotion self-centred rather than social (Baldwin, 1995). Baldwin thus mitigates the interpretation of cooperation in these emotional responses. Although Baldwin questions what may or may not be valid interpretations of the social cognition in infants, the

most prevailing view is that infants have the ability to share attention and to join in meaningful social interaction within their first year of life (Siller & Sigman, 2002).

Probably the most systematic theoretical contribution to the understanding of social cognition in early development comes from Tomasello et al. His theoretical framework positions itself closer to Trevarthen's account compared to that of Baldwin. Tomasello interprets the child within the first year as a social agent with the ability and intentions to interact reciprocally with other persons (2008). When the child shows these kinds of reciprocal skills when interacting with other people, this is for Tomasello an indicator that the child understands not only itself, but also others, as intentional agents (1995).

The discussion above refers to what we interpret from behaviours such as joint attention and joint engagement. These terms refer to mental representations, and hence are abstract theoretical terms. Some speak of it as a meeting of minds (Bruner, 1995), or a reciprocal awareness between two people. Some have more conservative interpretations when it comes to looking at these behaviours as social cognition. This is a methodological debate, which is important to be aware of, but this debate will not be pursued further here but will be discussed in chapter 11.

5 Joint attention and Joint engagement

5.1 Joint attention

Joint attention may be referred to as "skills that involve the referential triangle of child, adult, and some third event or entity to which the participants share attention" (Carpenter, Nagell, & Tomasello, 1998, p. 1). The development of joint attention skills is closely connected to different domains such as IQ and cognitive development (Ulvund & Smith, 1996), social cognition (Carpenter et al., 1998), self-monitoring, attention-regulation, social motivation (Vaughan Van Hecke & Mundy, 2007), and emotion-regulation (Morales et al., 2005). The majority of investigations, however, concerns joint attention and the connections these skills have to language development (see for instance Baldwin, 1995).

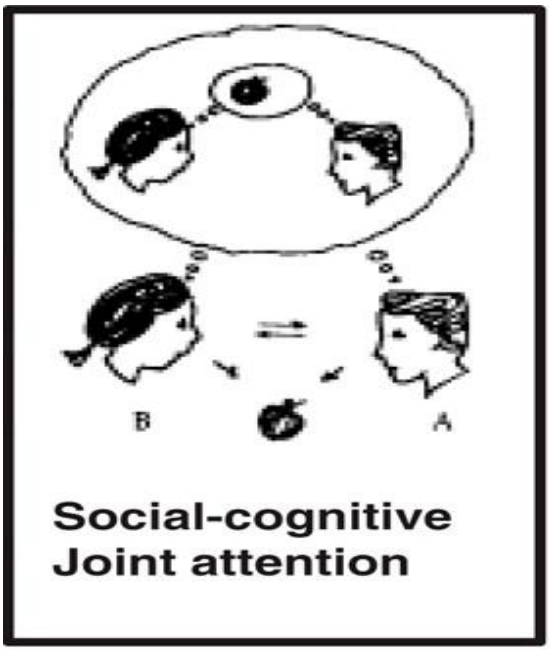
Bruner's research on joint attention has been of major importance to the field of joint attention and joint engagement. Scaife and Bruner's study from 1975 investigated gaze following in typically developing children ranging from 2-–14 months. Children were seated in a chair, face to face with an experimenter. The experimenter turned his head 90 degrees to each side after establishing eye-contact with the child. The aim of the study was to see if the child looked in the same direction as the experimenter. The results showed that higher responses to gaze-following correlated with the child's age, but it was only when the children had reached the age of approximately 8-–10 months that they followed the experimenters gaze in over 50 % of the time (66.5 %). The children that were 11-14 months followed the experimenters gaze in 100 % of the instances. Scaife and Bruner (1975) called this ability to follow another person's gaze joint attention. This led Butterworth, among others, to define joint attention as "looking where someone else is looking" (Butterworth, 1995, p. 29). Despite Butterworth's definition, joint attention includes other skills than mere gaze following (see below).

Bruner's theoretical framework must be seen in its historical context. Trying to counterpart Noam Chomsky's notion that language is for the most part innate, Bruner opposed to the model of language acquisition device (LAD), and introduced the acronym LASS, the language acquisition support system (Bruner 1983; Carpenter et al., 1998). This system build upon *adult scaffolding* (Bruner, 1982; Carpenter et al., 1998), where the parent or significant other supports the child in interactions with the world, introduces the child to the culture, and thus supports the cultural learning in line with a Vygotskyan theoretical perspective. Because of this oppositional stand against nativist theories, Bruner stresses the adults' contribution to the interaction between child and adult. Another point made by Scaife and Bruner was that if children in their first year can orient themselves with respect to another, they may be "considered as less than completely egocentric" (1975, p. 266), challenging early Piagetian theory as well.

Amount of social cognition is not easily measured. Different methods have been developed to try to give information about infants and children's social cognition. Of course, joint attention has been one operationalization for the abstraction of social cognition. Some of these measurement tools are based on different behaviours that are called joint attention skills.

5.1.1 Joint attention skills

Joint attention skills normally develop throughout a child's first year, and are refined during the second year. Developing joint attention is seen as one of the milestones in childhood development (Carpenter, Nagell, & Tomasello, 1998; Smith 2001; 2002). The skills are used as markers telling us about the ability to engage with another person, and, because the skills are communicative in form, help the child and the significant other to coordinate social interaction (Wetherby, Watt, Morgan, & Shumway, 2006). Generally these skills are impaired in children with autism (Charman, 2003).



Picture 5.1. Two persons sharing the same focus. From Mundy & Newell, (2007)

One attempt to operationalize joint attention is the Early Social Communication Scale (ESCS) (Mundy et al., 2003), a semi-structured test used to measure preverbal communication in children. This test is designed to measure how a child initiates or responds to attention and behavioural requests, and how the child participates in social interaction. The behaviours indicating joint attention are if the child is pointing to objects or events, alternate gaze, shows or gives objects, all for the purpose of sharing with the test-administrator– or if the child follows the testers' pointing-gestures and eye-gaze when looking in a book or at posters (Mundy et al., 2003). One important dimension in the ESCS is that it differentiates between the intent of sharing for the sake of sharing, called proto-declaratives, and proto-imperative gestures that are mere behaviour regulations, that is, an intent to use the other as a means to an end (Bateson et al., 1975).

Another important division that ESCS is designed to measure is to what degree the child responds to and initiates social communication. One such response to social communication, called "responding to joint attention", is when the test-administrator points his/her finger towards one of four posters on the wall in the room, and the child then looks in the indicated

direction. Most children manage to understand where to look when they approach the end of their first year. This may come as no surprise when thinking of Scaife and Bruner's study (1975), where 100 % of the typically developing children managed a similar task having only eye-gaze to follow.

Another condition in the ESCS measures the child's ability to initiate joint attention. This could be if the child were to alternate its gaze back and forth between the test-administrator and an interesting toy on a table as if to share the experience with the administrator. Research on the initiation of joint attention finds that children with autism have severe problems in showing this skill, and that this tendency can be found from early childhood through adolescence (Sigman & Ruskin, 1999).

Picture 5.2. Child showing a play card and coordinating gaze. typical joint attention skills used by 3-year olds with typical development

The ESCS is widely used in research, especially when assessing children with autism in relation to joint attention. Nevertheless, as we saw in the section on social cognition, the same critique may be applied when addressing the interpretations from behavioural skills to inferring mental states.

5.2 Engagement as social interaction

The concept engagement is often supplanted by other terms such as participation, inclusion and involvement. Compared to concepts and words in close proximity, engagement sounds more involving than its semantic correlates (Felson Duchan, 2009). There are at least two distinct ways engagement has been used when looking at caregiver and infant relations. One way of looking at it derives from Stern's work and is used as a type of engagement in relationships. In his work, Stern focus on how child and adult are affectively attuned to each other (Felson Duchan, 2009). Another way of looking at engagement derives in large part from Bruner's work (1975), focusing more on the engagement related to activities. These routines are indicated through joint attention acts and turn taking. The research on joint engagement follows in Bruner's footsteps in large part. Nevertheless, Stern's work is not overseen in this line of research. The last decade have seen many researchers calling for more investigations targeting affect attunement between child and adult when assessing dyadic exchanges in routine activities (Hobson, 2005; Striano & Bertin, 2005).

At the core of the definition of joint engagement lies an emphasis on social interaction between two people sharing attention to an event or object. This is by no means groundbreaking, nor is it a revolutionary emphasis. Still, social interactions, focusing on not only the child but also its interacting partners, have had an increasing influence in the study of developmental psychology over the last few decades. For instance, the theories that influenced Adamson and Bakeman to start looking at joint engagement had cognitive and social-constructivist elements built on cognitive and social-constructivist assumptions/theories. Cognitive theoretical influence is here seen in line with cognition the way Vygotsky and Bruner would use the term, rather than what we find in Piaget's early theoretical framework.

The point is that the cognitive theories have become more attuned to the impact social surroundings have on each individual's cognitive development. Metaphors like "information processors", implying computer-like thinking thus seems too rigid when addressing the mind. Such metaphors may overlook important aspects concerning human development (Bruner, 1993). This does not mean that theories emphasizing cognitive processes have no place in the study of development. Such cognitive processing theories are highly important in understanding what goes on in a child's mind. It is the combination of aspects relating to the child's cognitive processing and how this may shape and be shaped when encountering the social world that best can describe what goes on in social interaction. Especially when it comes to children with autism, this mixture of theoretical perspectives needs to be taken into account.

5.2.1 Joint engagement

Closely related to joint attention is the *joint engagement.* Joint engagement can be defined as two people's active involvement with each other whilst coordinating their attention between the other person and the object at hand (Bakeman & Adamson, 1984). Joint engagement has been related to various developmental domains such as language, emotional development, and the ability to understand symbols (Adamson, Deckner, & Bakeman, 2009; Adamson & Bakeman, 1985; Toth, Munson, Meltzoff, & Dawson, 2006).

The developmental trajectory preceding joint engagement is hypothesized to be as follows: Through the acquisition of joint attention skills, infants gain an entrance into sharing experiences with others. These sharing experiences may serve as "zones of proximal development" (Vygotsky, 1978). Within these experiences caregivers or significant others can facilitate the child to join in affect-laden and intention-filled social interaction (Adamson, Bakeman, Deckner, & Romski, 2009). In this sense it becomes clear that joint engagement is not just social interaction per se, but is a social interaction that contains a qualitatively richer exchange between two people. Further, it has also been proposed that joint engagement may facilitate the acquisition of "theory of mind" (Nelson, Adamson, & Bakeman, 2008), another

important milestone in a child's development, appearing around 3-–4 years of age (Baron-Cohen, 1997).

One classic study on joint engagement investigated infant's interaction with their mothers and peers (Bakeman & Adamson, 1984). In this study they investigated children between 6-–18 months longitudinally, seeking information about developmental trajectories of joint engagement. The results indicated that both nonverbal gestures and verbalizations were most likely to occur when the dyad were in joint engagement. The study also showed that as age increased, so did time spent in joint engagement. These findings were particularly true when the child was engaged with their mothers as opposed to playing with their peers. The authors assume that this occurs because the mothers are using *scaffolding* techniques to attempt "to embed objects in social interaction" (Bakeman & Adamson, 1984, p. 1278).

Similar to this study, Tomasello and Todd (1983) wished to explore individual differences in mother-–child in relations to time in joint engagement and lexical development. They found support to their hypothesis that time dyads spent in coordinated joint engagement during free-play predicted children's later lexical development (r .84).

In line with the two studies mentioned above, theoretical claims are made about the importance of joint engagement and the need for a significant other to work as a scaffolding agent for infants. Moreover, claims are raised suggesting that the ability for a significant other to follow the child's attention focus has positive consequences in relation to later vocabulary (Carpenter, Nagell, & Tomasello, 1998). Bakeman and Adamson (1984) also suggest that children from 15–18 months are clearly motivated to be in a state of joint engagement, as they very much appreciate this kind of "mental meeting" of minds.

The theoretical positions taken by the researchers mentioned in this section belong to the socio-cultural perspective. However, the findings and theoretical claims can neatly be fitted into a perspective with more emphasis on cognitive processing. The ability to coordinate joint

attention and participate in joint engagement can in processing theories be viewed as having both cognitive and motivational advantages when communicating. Within the cognitive tradition, joint attention and being in joint engagement may be seen as a way of enhancing the process of finding out what are the underlying themes of communication (Sabbagh & Baldwin, 2005). From this perspective joint attention and –engagement can thus be a tool the child employs to draw inferences that can save valuable processing-capacity, as a kind of cognitive shortcut or heuristic.

Even though there have been conducted many experiments and observational studies leading to a better understanding of joint engagement and its role in development, these investigations have mainly focused on the effects joint engagement have on the domain concerning language development. One of the domains that is not much addressed in the earlier research is the affective component, leading many researchers to address the need to look into the aspects concerning what role affect plays in joint engagement (Striano & Bertin, 2005). Early studies that did look into affect were Mundy, Kasari, and Sigman (1992) and Adamson and Bakeman (1985). These investigations were, until recently, the exception that proves the rule.

In the past few years we have seen many studies focusing more broadly within developmental domains and factors. For instance, Peter Hobson and colleagues (2008) are interested in different kinds of qualities that are important to joint engagement states. In the book "Joint Attention: Communication and other minds (Eilan et al., 2005, p. 201) Hobson asks: "what puts jointness into joint engagement?", but before a discussion on what these factors of jointness might be, a broader picture of what lies within the conception of joint engagement will be presented.

5.2.2 Engagement states defined

In this section the coding paradigm for different engagement states will be presented based on the research conducted by Bakeman and Adamson (1984; see also Adamson & Bakeman, 1985; 2004; 2008; 2010). This paradigm includes six mutually exclusive periods. These

periods are meant to describe how children interact with their significant other, during a 10-minute free-play session. Category 1 is *unengaged*, meaning that the child appears to be uninvolved with any specific person, object, or event. Category 2 is called *onlooking.* In this state the child is observing another's activity. The child may be looking attentively but is not otherwise participating in any way. Category 3, *person engagement,* involves the child interacting with another person with no object at hand, typically face-to-face interactions tickle games or other person play. Category 4 is called *object engagement* and involves the child just attending to an object or event that the other person is not involved in. Category 5 and 6 are the two joint engagement states and need more thorough descriptions. Not only are they in many cases the states that are believed to be of special importance for various developmental domains, they are also more complex and similar than the other categories.

When trying to disentangle the two joint engagement states, the main clue lies in the names of the categories. Category 5 is called *supported* or *passive* joint engagement, as in the early papers by Bakeman and Adamson (1984; 1985). Category 6 is named *coordinated joint engagement.* In both categories, the two persons are engaged in the same object or event. These are the states where two people have the "meeting of minds" previously mentioned. Their attention is directed to the same thing or following the other's focus, whether this be hands-on the object, or looking where the other person is looking.

The reason why category 5 is called *passive* or *supported* is that there is a clear asymmetrical element to the interaction. This builds upon Bruner's hypothesis that caregivers provide the scaffolding needed because the infant does not to the same extent show the readiness to initiate such social interaction (1982). In this the name supported points back to the caregiver, and the word "passive" is the role of the child or infant. The point made about the child needing much support must be seen in relation to the age of the child. The original focus of Bruner, and also Adamson and Bakeman, when addressing this was infants (in the case of Adamson and Bakeman, infants in the age cohort 6–18 months). The need for support in free-play for these infants are naturally higher than would be the case for older children. However, children with different sorts of disorders and diagnoses, support from adults in free-play and other interactional settings is needed even when the child becomes older. Specifically, studies

have shown that children belonging to the autistic spectrum have a deficit in initiating social interaction (Adamson et al., 2008; Levy, Mandell, & Schultz, 2009).

Coordinated joint engagement, the sixth category in the coding paradigm, is to a lesser extent asymmetrical compared with supported joint engagement. This is because for the category to be scored, both persons in the dyad must show joint attentional skills, and hence be more in tune with each other. This means that both partners occasionally establishes eye contact with the other, or points, picks out an object or event, or gives an object with the intention to share. Thus it may be argued that coordinated joint engagement consists of supported joint engagement *plus* joint attentional skills.

As the sections above show, joint engagement and joint attention are important aspects in early childhood development. Now there will be an outline concerning the development of children with autism with respect to joint attention and joint engagement.

6 Autism and social engagement

6.1 Joint attention, joint engagement, and autism

As mentioned above, children with autism are viewed as having severe deficits in social interaction, impairments in verbal and preverbal communication, and repetitive behaviours with a restricted repertoire of interests and activities (Hill & Frith, 2003; Levy, Mandell, & Schultz, 2009). The ability to produce joint attention skills is one of the clearest early markers of autism (Mundy, 1995). Many view the development of joint attention as pivotal for further development in some domains such as language (Charman, 2003). Other populations, such as children with Down syndrome, also have trouble with responding and initiating joint attention, but they still outperform children with autism on these skills (Joseph & Tager-Flusberg, 1997). The same is true for joint engagement (Adamson, Bakeman, & Deckner, 2009). Specifically, children with autism do not show the same patterns when it comes to initiating social interaction (Mundy, 2010).

Among the areas of development, difficulties in joint attention and -engagement is strongly linked to poor language development, and poor development of a theory of mind. This supports the notion that children with autism have some underlying deficits when it comes to joining in social interactional exchanges. Despite these deficits, interventions targeting joint attention skills show a beneficial increase in many developmental domains for children with autism (Carpenter, Nagell, & Tomasello, 1998; Gulsrud, Jahromi, Kasari, 2009; Lewy & Dawson, 1992; Siller & Sigman, 2002).

One often mentioned phrase within the research on joint engagement is from Vygotsky, who said that “if we ignore the child’s needs, and the incentives which are effective in getting him to act, we will never be able to understand his advance from one developmental stage to the next” (Vygotsky, 1978, in Adamson, Deckner, & Bakeman, 2010 p. 665). This theoretical comment has been tested many times in play settings with both typically developing children and in children with autism. The theoretical term “scaffolding” (Bruner, 1982) suggests the

same practical suggestion. Although this is important in play with typically developing children, the scaffolding principle is perhaps even more important when playing with a child with autism.

Many children with autism have difficulties in responding to joint attention in a normative manner when tested with ESCS (Mundy, Sigman, & Kasari, 1994). Responsive behaviours such as following pointing gestures are clearly delayed in children with autism. Where a typically developing child have no problem following another person's pointing gestures, a child with autism may stare only at the pointing index finger seemingly not understanding what the other person wants.

Another aspect of social interaction is that there have been inconsistencies regarding investigations looking at social interactional exchanges demanding certain turn-taking skills. Although many studies report that children with autism are delayed in their ability to show social responsiveness, some studies find that children with autism playing with their mothers look no less on their mothers than typically developing children (Kasari, Sigman, Yirmiya, 1993b; Sigman, Mundy, Sherman, & Ungerer, 1986). When discussing these studies, Kasari and Sigman claims that children with autism "…did not seem any more avoidant than the typical or mentally retarded children." (Kasari & Sigman, 1995, p. 198). This may be in line with investigations looking at children with autism and their ability to form attachment to caregivers. Although these children may convey more behaviours related to disorganized attachment behaviours (Capps, Sigman, & Mundy, 1994), they also show changes in behaviour when separated from their caregivers (Sigman & Ungerer, 1984).

Other studies on social responsiveness are not in line with Kasari and Sigman's early studies. For instance, Adamson et al. (2001) found that boys with autism more often appeared inattentive to their mothers' bids compared with a control group of typically developing boys and their mothers during joint engagement. One reason for the inconsistencies in these studies may be because the latter study by Adamson et al. used a more precise measure. These

researchers differentiated between behaviour regulation, and behaviour that can be viewed as having the intent to share an object or event.

To further add to the inconsistencies when it comes to social responsiveness, some studies show that there are differences relating to the developmental trajectories when comparing typically developing children with the autism group. In this case, taking into account the differentiation between joint attention and behaviour regulation, Nation & Penny (2008) found that the impairments children with autism have in responding to joint attention bids seem to decline somewhat as the child reaches approximately 30-–36 months of age (see also Chawarska, Klin, & Volkmar, 2003). This lack of responsiveness thus may be seen as a delay rather than a lasting deficit.

Even though children with autism perform quite well in some aspects of social interaction, there are other areas that stand out as clearly problematic when comparing this group with both typically developing children and children which have other developing disorders. One of the most salient and robust findings in research on autism and social development is their lack of ability to initiate interaction with others for the sake of sharing experiences. For instance, children with autism have severe difficulties initiating joint attention in relevant situations (Mundy & Gomes, 1998).

When matching mental age between a group of children with autism and a control group of typically developing children, the significant differences (**) between the two groups are only related to low mental age when looking at the children's ability to respond to joint attention (RJA) (Fig. 6.1). When it comes to the initiating of joint attention, the picture becomes different. Children with autism, regardless of whether they have high or low mental age, score significantly lower than their mentally matched control group on initiating joint attention (IJA).

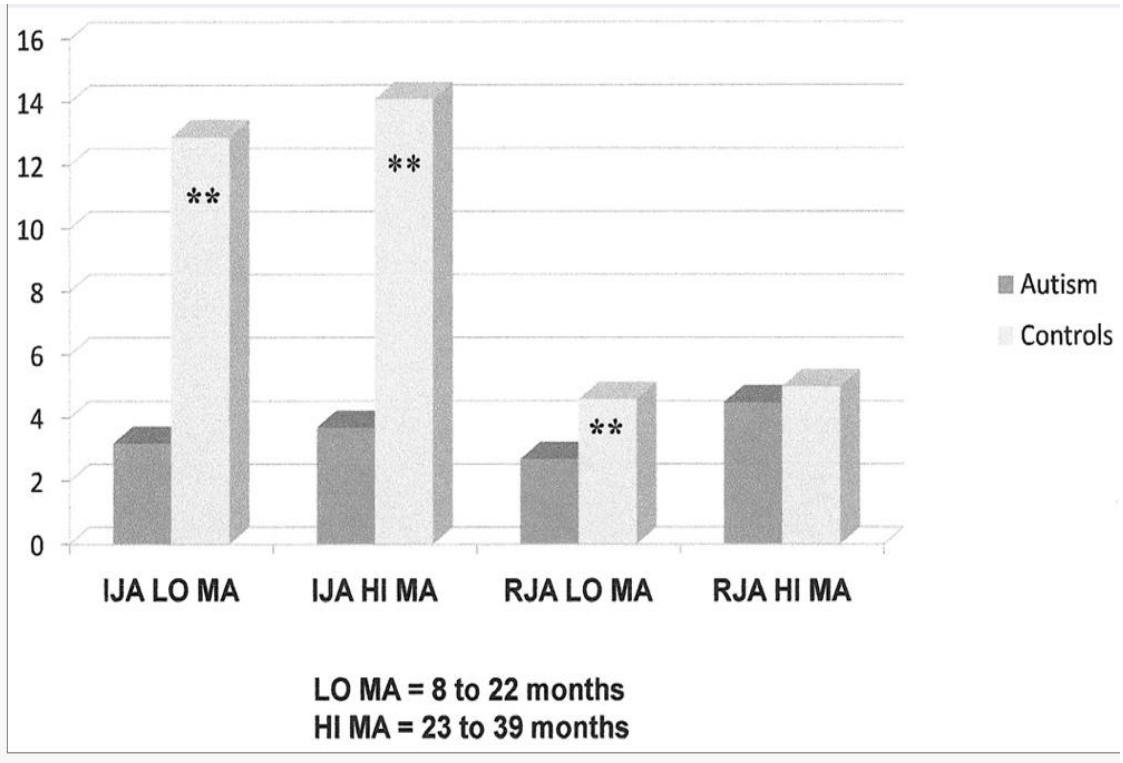


Figure 6.1. Initiating and responding to joint attention comparing children with autism to a control group of children with typical development (from Mundy, Sigman, & Kasari, 1994)

One might then suggest that if social interaction is to occur between an adult and a child with autism, the initiative will mostly need to come from the adult. Although the results from figure 6.1 were obtained using the ESCS-test, where a child and a test-administrator is seated at a table, there is good reason to believe that this lack of initiation from the child would be present in free-play as well. In fact, the ESCS is structured to spur joint attention from the child and is quite potent for this purpose. In an unstructured free-play setting, it is reasonable to assume that the lack of initiation would become even more salient in children with autism.

6.2 Coordinating joint engagement

When Kasari and Sigman (1995) report finding no significant differences in social interaction between children with autism and typically developing children, this may relate to the ways of operationalizing social interaction. Kasari and Sigman report their findings from the ESCS test described above. To test for social interaction, the ESCS as mentioned above is a test that is meant to measure joint attention. For this purpose the test is quite good. When it comes to assessing social interaction which is one part of the ESCS, it is however important to mention that this test is a semi-structured test where the child and a test-administrator are seated at a fitting table. For the child with autism, this means that they are in a context that is at least, to some extent structured. The toys that are being used are chosen by the test-administrator and do not leave much doubt as to what is expected of the child. When addressing social interaction there are as we see from the discussion above various aspects that may lead to different results. Social interaction is quite complex. This means that social interaction may be different when the structure is high or low and in what context we want to measure social interaction.

So how do children with autism do compared to other groups in a less structured setting when measuring aspects of social interaction? The table below show results for three groups of children during free-play with their mothers over five different points in time.

As we see from figure 6.2, children with autism spend less time in both joint engagement states overall, and in coordinated joint engagement, compared to children with Down's syndrome and typically developing children. This show that there are differences in social interaction when aspects of social interaction are operationalized in more strict manners. This also shows that joint engagement is not just social interaction. Joint engagement can thus be seen as more specified term within the broader classification that makes up social interactions. It has a more involving aspect as noted by Felson Duchan (2009).

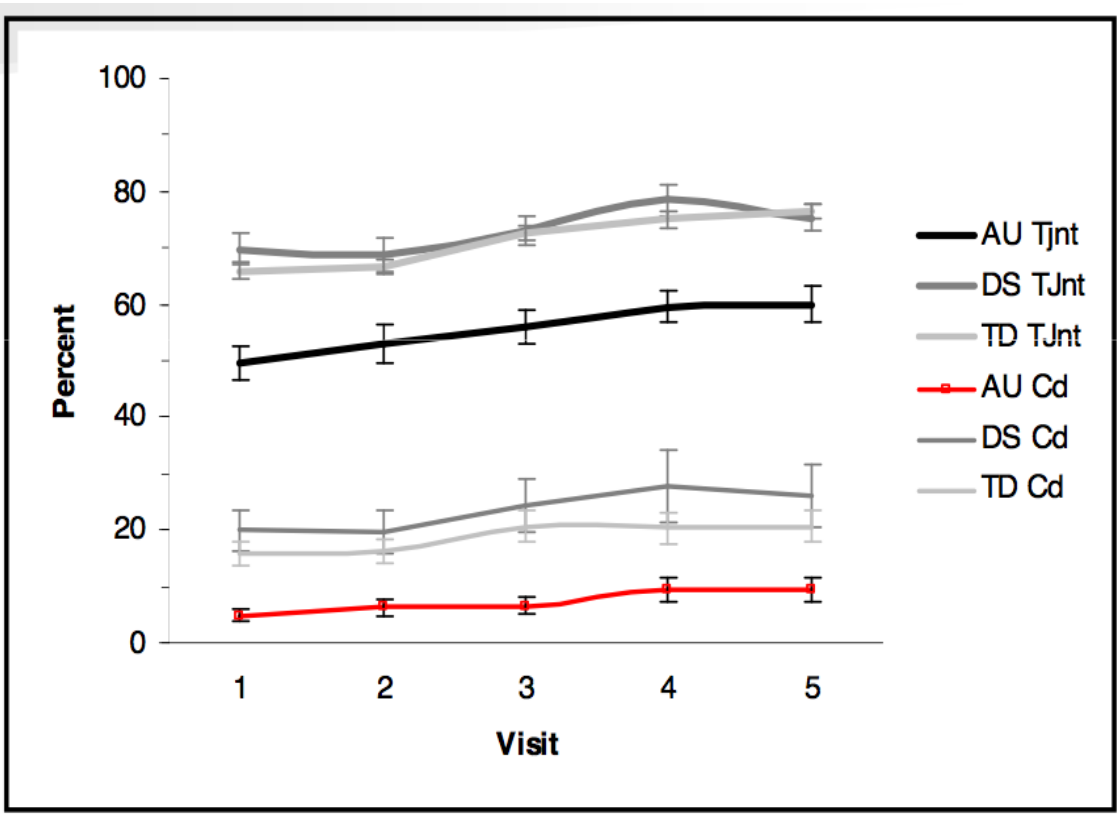


Figure 6.2. Children with autism (AU), Down's syndrome (DS), and typical development (TD), for overall time spent in joint engagement (Tjnt) and time spent in coordinated joint engagement (Cd). (From Adamson et al., 2001)

Note also from figure 6.2 that coordinated joint engagement in children with autism, in this study were quite low. Because of the short amount of time children with autism spends in coordinated joint engagement, this category often is integrated in to a larger category of overall joint engagement when presented in articles for statistical purposes. Another study shows the difference in amount of joint engagement states between children with autism and other groups.

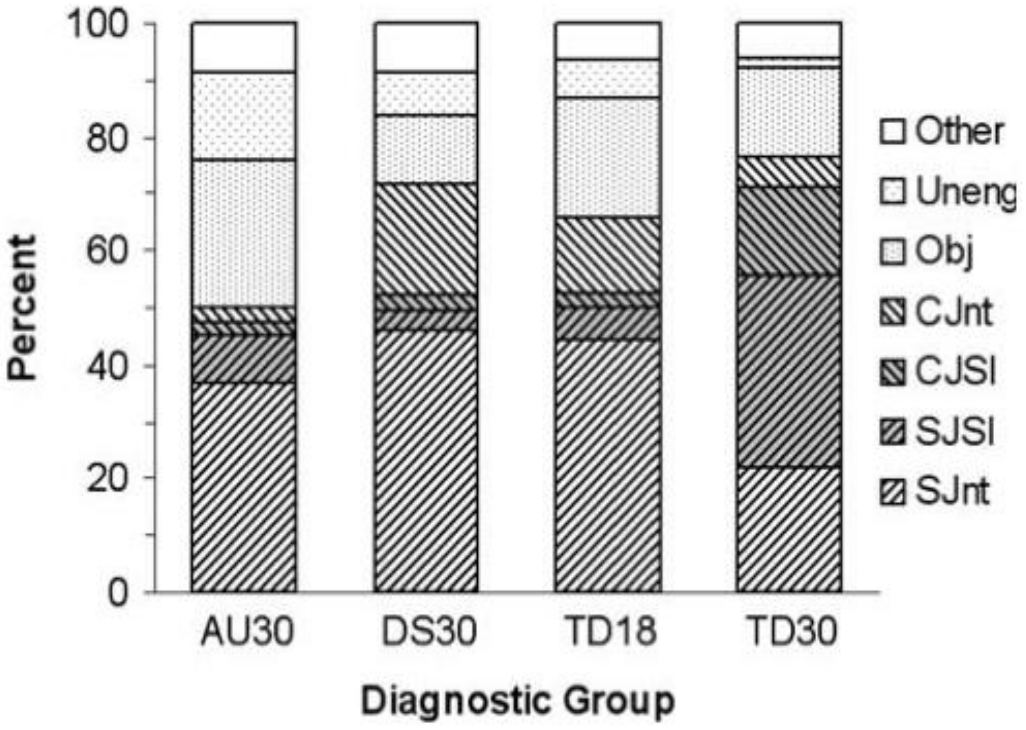


Figure 6.3.

Mean engagement state percentage by diagnostic group. AU30= autism 30 months old. DS30= Down Syndrome 30 months old. TD18 and TD30= Typically developing children 18 and 30 months old. Right upward stripes represent supported joint engagement (SJnt+SJSI). Coordinated joint engagement (CJnt+CJSI) is represented by right downward stripes (From Adamson, Bakeman, Deckner, & Romski, 2009).

We see that children with autism spend less amount of time in coordinated joint engagement with another partner during a 10-minute free-play session, when compared to other groups. We also see how children with autism have more focus on objects and that they even when 12 months older than the typically developing children can not match the time in joint engagement overall. Further we see that the children with autism spend approximately 50% of their time in overall joint engagement with their mothers.

Even though the autism group spends very little time with their partners coordinating attention to a shared object, they do tend to join in a fair amount of supported joint engagement (Adamson, Bakeman, Deckner, & Romski, 2009).

6.3 The role of free-play in development?

The focus on how researchers view free-play, and the role this kind of context plays in development, has changed over the last few decades. In short, the functional aspects of play have been directly linked to outcomes in development (Williams, 2003). Williams also argue that play serves as an important information gathering strategy for research purposes.

As Williams points out, the focus on developmental gains in free-play have been neglected. Unstructured settings have been shown to be arenas where much learning and development can take place. Considering autism, many theoretical claims have been made of the efficacy of behavioural intervention programs. Although there is a general meaning that behavioural therapy may work well with autism (Befring, 2004), this may have taken the focus away from these unstructured free-play contexts. If we take a look at language development, it is not necessarily the structured contexts where this kind of development and learning takes place (Baldwin & Sabbagh, 2005). Many interventions targeting children with autism and the enhancement of their various skills have been highly intensive when it comes to hours per week. This has in many instances not given any better results than interventions that set out to have not more than one hour per week of training (Rogers & Vismara, 2008). The intervention programs in general have shown efficacy in relation to various developmental domains, so there is good reasons to deploy such interventions.

Throughout the western world, integration of children with special needs in kindergartens and preschools has increased during the last decade (Anderson, Moore, Godfrey, & Fletcher-Flinn, 2004). Many argue that the gain children with special needs get from playing with peers have positive outcomes on their social development (Ballard, 1998). Considering the challenges children with autism have within the social interactional domain, there may be reason to look at this group as different when it comes to free-play with peers. The need of special attention to this aspect lies within the defining characters of what constitutes the autistic spectrum.

Although children with autism struggle in their social interaction with others, there is reason to believe that there may be positive outcomes if free-play is structured as in a pedagogical context. The assessment of gains from free-play settings has in large part been overseen, although some studies report that such play may be a very good predictor of later social communication (Toth, Munson, Melttzoff, & Dawson, 2006). When speaking of children with autism, knowing that one of the core deficits are within the social developmental domain, free-play may be one setting that should be attended to more by researchers in the future. In this study some of the factors that may play a role in free-play are assessed in relation to dyadic exchanges between adult and child with autism.

7 Theoretical anchoring of Variables

7.1 Target variables

The variables of interest in this thesis are *joint engagement, expansiveness, positive affect, change of object focus,* and *verbal utterances* (see appendix for concrete variable definitions and coding guidelines). Joint engagement is a variable measuring different states that a certain dyad resides in for a period of time. The other four variables are in this study measured in frequencies. These variables have been chosen after an extensive review of relevant literature, especially focusing on literature concerning social interaction. As Klin et al. (2007) point out, that difficulties in social interaction are at the core of what differentiates children with autism from children with other developmental disorder. Many studies have found that social interaction is the most potent predictor when it comes to diagnosing autism (Siegel et al., 1989). Thus, the lack of focus on social interactional aspects is puzzling. This however, has started to change within the last decade (Reichow & Volkmar, 2009). The importance to look into factors of social interaction is furthermore underlined in evaluative studies of interventions of autism. These studies find "…much supporting evidence for the treatment of social deficits in autism" (Reichow & Volkmar, 2009, p. 161).

7.2 Background for choice of variables

7.2.1 Joint engagement

More, compared to less, time spent in joint engagement is positively correlated to different developmental domains. Better expressive and predictive language (Adamson, Bakeman, & Deckner, 2004) and, more broadly, communicative skills (Siller & Sigman, 2002), are some of the areas linked to joint engagement. The variables that are investigated in this study are assumed to play an important role for the quality of joint engagement states. Research focusing on joint engagement has investigated different aspects concerning predictions within

the language domain. Still, there has not been much focus on other social interactional factors within joint engagement (Hobson, 2005; Striano & Bertin, 2005).

When reviewing the literature on dyadic exchanges between children with autism and adults, most studies have focused on mother–child exchange. These studies often place an emphasis on either the mother's or the child's contribution and not entirely assessing the whole dyadic interaction. Another aspect of this study is the additional comparison between mother–child and preschool teacher–child dyads. Siller and Sigman call for such investigations, and suggest that these comparisons have been neglected, perhaps because of sensitivity towards touching in on the earlier "fallacious, psychogenic theories of autism" (2002, p. 78).

It is important not to overlook the contribution of the child in the dyadic interactions. Nevertheless, research suggests that the child with autism has severe deficits when it comes to initiating social interactions (Adamson, McArthur, Markov, Dunbar, & Bakeman, 2001; Mundy, Sigman, & Kasari, 1990; Sigman & Ruskin, 1999). This lack of initiation in comparison to adult partners usually affects all areas of social interaction.

7.2.2 Positive affect

Investigations of affect in children with autism have been scarce, although some attempts stand out as exceptions to the rule (Hobson, Lee, & Hobson, 2008; Mundy, Kasari & Sigman, 1992; Striano & Bertin, 2005,). Understanding and displaying positive affect such as smiling, cheerful behaviour, and laughing are of major importance to social communication. Discriminating between emotional expressions can be seen in typically developing children from the age of 10 weeks (Haviland & Lelwica, 1987).

Children with autism have much difficulty with the ability to discriminate and interpret expressions of positive affect (Golan et al., 2009). Not only do children with autism have difficulty with deciphering the social content of positive affect in a partner, they also produce

less positive affect compared to typically developing children. The same holds true when compared to groups of other developmental disorders (Kasari, Sigman, Mundy, & Yirmiya, 1990). This lends support to the notion that autism may be associated with disturbances related to affective sharing. Also this would be in line with the descriptions of the eleven children in Kanners original article (1943). Various investigations suggest that children with autism do attend to people's faces just as much as typically developing children. The difference is that there seems to be different aspects of the human face that are the centers of attention for the child. The typically developing child focuses in large part on the area surrounding the eyes, whereas children with autism have a tendency to look at the mouth (Klin et al., 2009). Different investigations also suggest that children with autism perceive facial cues and body language in non-normative manners (Hobson, 2004, Klin et al., 2008). Supporting the hypothesis of a disturbance in the affective sharing has thus been given to the study conducted by Kasari and colleagues (1990). The findings that children with autism not only struggle with processing emotional cues from faces (Klin et al., 2008; 2009), but have the same problems with perceptions with bodily cues (Hubert et al., 2007) support the notion of affective disturbances.

7.2.3 Expansiveness

Expansiveness in this study is defined as a measure of the relative ease of introduction of a new aspect or object to an already ongoing activity. This is hypothesized to be a factor that will prolong time spent in joint engagement. Although the introduction of a new aspect to an ongoing activity may lead to a disruption of the activity because of over-stimulation and overload of information-processing on the child's behalf, it is here believed that when such expanding behaviours occur it will make for a dynamic bridging between the focus-object and the new object.

Typically developing children are relatively good at exploring their environment when various objects are in proximate distance. In the same context, children with autism seem more rigid in their way of orienting themselves. Ruff (1984) found in one study that a lower percentage of children with autism showed exploration-behaviours related to objects,

compared with matched age groups of typically developing children and children with Down syndrome. This is related to the preference children have for objects (see below). However, expanding on objects does not mean a clear shift of attention for either the child or adult, but rather an incorporation of the new object or event that fits in with the object or event that is the focus of attention.

7.2.4 Change of object focus

The variable change of object focus, is related to how many times during joint engagement the child or adult changes their focus to a completely new object and thus stop the activity that was the original shared focus of attention. Although the rationale of overload to information processing may be a consequence when such a shift in attention occurs, it may also lead to a sustained engagement between the adult and child.

There are at least two reasons why the changing of object-focus may lead to a prolonging of joint engagement. The first reason concerns how the adult may introduce a new object and get the child to change the original focus to the new object. If this is done in a successful manner it would lead to a dynamic change where the dyad can start exploring a new object when the original have become boring or is not seen as an object of interest any more. The second reason has to do with how the adult follows the child's focus of attention. An adult sensitive to the child's focus have by many, been seen as one of the most important factors for sustaining the contact with the child (Bruner, 1982; 1993; Carpenter, Nagell, & Tomasello, 1998). This sensitivity to follow the child's attention, and to act appropriately upon these shifts, is related to "adult scaffolding" (Bakeman & Adamson, 1984).

Children with autism deviate from typically developing children when it comes to focusing on singular objects (Williams, 2003). The time spent focusing on an object is significantly longer for children with autism (Adamson, Deckner, & Bakeman, 2010; Bainbridge Brigham, Yoder, Jarzynka, & Tapp, 2010). In more specific detail, this focus on singular objects relates to time spent physically manipulating the object at hand and not necessarily using visual examination

(Williams, 2003). Christensen et al. (2010) argue that in relation to object-directed play, children with autism may not understand people as potential partners for play actions. They further argue that these children are not motivated to participate in this kind of direct play with others. This in turn supports the notion that children with autism need to be seen as distinct to other groups of children when it comes to play interaction. Again, this suggests that appropriate scaffolding from significant others may be needed to get the child to participate and stay in joint engagement.

7.2.5 Language

The role of language is an important factor in early interaction and communication. The ground premise is that there is a link between early non-verbal communication and language development (Carpenter, Nagell, & Tomasello, 1998). Following Bruner's theoretical account (1982; 1993), an adult's language when playing with a child may be viewed as a scaffolding device for developing what Bruner calls the child's language acquisition support system (LASS). Although Baldwin (1995; 2005) claims that this kind of focus leads to an overrepresentation of the adult's contribution, she adheres to the point made by Bruner that following the child's attentional focus has positive outcomes for the learning of language. This will also lead to maintaining and prolong the time dyads spend in joint engagement.

As the variable is defined in this thesis, it is only the language produced by either the child or the adult that has a clear communicative intent that is accounted for. Further differentiation concerning the content of language has not been assessed. This has been done in other studies distinguishing symbolic and non-symbolic content (Adamson, Deckner, & Bakeman, 2004), or prescribing vs. describing utterances (Rydland, 2001).

8 Research questions

This study investigates how children with autism play with their mothers and preschool teachers. The investigations will encompass three research questions, which are as follows:

Research Question 1:

Are there differences in duration of joint engagement between the dyads mother-child and preschool teacher-child?

Research Question 2:

Are there differences in the frequency of *expansiveness, positive affect, change of object-focus*, and *language* between *and* within the dyads mother–child and preschool teacher–child when in joint engagement?

Research Question 3:

Is there a relationship between the variables within each dyad?

An exploratory post hoc analysis was conducted on the basis of the results from research question 3. The variables for adult positive affect and child language were the target of investigation. This was done on the grounds that there were found compelling differences between the dyads on these particular variables.

Because there is a lack of research comparing children with autism in play both with mother and preschool teacher, exploration of these relationships are thus quite interesting. Despite the lack of former investigations some general expectations for the results can be made.

Since children with autism show deficits in initiating social interaction, it is reasonable to assume that in both groups the adults will have a higher frequency in all the variables, leaving the contributions within the dyads in both cases to be substantially asymmetrical (Adamson, Bakeman, Deckner, & Romski, 2009). Because the design of this study compares the same children with autism in two different settings (one with mother and one with preschool teacher), one assumption is that there will be no significant difference between the child's contributions in the two settings.

9 Method

9.1 Formal aspects

This study is based on data form the study "Effect of joint attention intervention for young children with autism – a randomized controlled trial" at Oslo University Hospital, Child and Adolescent Mental Health Research Unit and Centre for Child and Adolescent Mental Health, Eastern and Southern Norway. Oslo University Hospital research ethics committee and, the Norwegian national committees for research ethics approved the larger intervention study.

The participants were recruited through their child and adolescent health services and child habilitation services to participate in a larger intervention study at Oslo University Hospital and the Centre for Child and Adolescent Mental Health, Eastern and Southern Norway (R-BUP). Written consent to participate were signed by all parents Following parent confirmation of the study, preschool teachers were informed about the study and written consent was obtained. Inclusion criteria were that the child was between the ages of 24 to 60 months, and that they had a confirmed diagnosis of childhood autism. Also all children had to be preliminary enrolled in preschool. Exclusion criteria were if the child had any central nervous system difficulties in addition to their autism such as epilepsy or if the parents did not speak Norwegian.

9.2 Participants

Sixty-one children (48 males/13 females) with a confirmed diagnosis of autism (mean age = 48 months, range 29-60 months) from Eastern and Western Norway participated in the larger study. Before computing the data using PASW® statistics editor (18.0), some dyads were excluded from the data analysis that make up the sample in this study, because of low time spent in joint engagement (below 60 seconds during the 10 minute free-play session were used as cut off point). This was done on the grounds that they were seen as outliers not representative to the sample.

9.2.1 Outliers

Outliers can often lead to inflated error of statistic estimates and distortion of parameters when using parametric tests (Zimmerman, 1994). Whether to remove or to keep outliers in the data analysis is not an easy decision to make. Researchers disagree on whether it is right to do this or not. One question of importance is if the outliers can be seen as natural to the population that it is meant to say something about or not. In this study the outliers were presumed to have occurred because of standardization failure. In this case meaning that the adult may have misinterpreted the meaning of the free-play procedure due to unclear instructions from the test-administrators, or that the child for some reason became uncooperative due to for instance fatigue or the like.

9.3 Statistical procedures

Simple mean comparisons were used as the statistical measure for computing time spent in joint engagement. Statistical computations such as the Wilcoxon signed ranks test was considered for the data analyses on the variables positive affect, expansiveness, change of object focus, and language, since this particular non-parametric test often is used when distributions are skewed. The skewness in the distributions was however not considered large enough to be of importance. Also, since the samples in this particular case were not independent, this test was not used.

For all tests the sample consisted of 53 dyadic pairs after excluding 8 dyads from the analysis. Although this leads to somewhat lower statistical power, the ability for the tests to detect significance was still seen as high with an n=53.

9.4 Recording procedure

Dyads of mother-child and preschool-teacher-child were provided with a standard set of toys and instructed to play as they typically would do in a natural setting, and then video taped for

10 minutes. One camera was used to record the play settings. In some instances when the child acted uneasy or decided to leave the room, the recordings stopped until the child and adult again were back in appropriate activity. However this happened rather seldom.

9.5 Coding and measures

9.5.1 Joint Engagement

Each play session was first coded for duration of six engagement states (unengaged, onlooking, person engagement, object engagement, supported joint engagement, and coordinated joint engagement) (as in Adamson & Bakeman, 1984, see also appendix for coding guidelines).

Unengaged	The child appears uninvolved in any activities, objects, or with the adult. The child may be looking around and scanning the room, but is not focusing on objects or the adult.
Onlooking	The child looks at the adult playing, but is not participating in the event.
Person engagement	The child is only interacting with the adult, with no objects involved
Object engagement	The child plays by itself with a toy or object. There is no communication or interaction between the child and adult that relates to the object or toy
Supported joint engagement	The child and adult is actively involved with the same object but the child show little awareness, and does not actively acknowledge the adult's contribution.
Coordinated joint engagement	The child and adult is actively involved with the same referent, and the child is actively and repeatedly acknowledging the adult's participation, likely by visual referencing the parent at critical junctures in the interaction.

Table 9.1. Engagement states definitions.

The time the mother–child and preschool teacher–child dyads were in supported and coordinated joint engagement during video recorded play were collapsed in to one category of overall joint engagement. The time either the adult or child was outside the camera angle were subtracted from the analysis.

Duration of joint engagement was converted from seconds to percentage. The mathematical computation of the percentage of time in joint engagement is as follows:

(Total time in joint engagement/(10 minutes-time out of camera)) x 100

9.5.2 Positive affect, expansiveness, change of object focus, and language

For the variables *positive affect, expansiveness,* and *change of object-focus* within mother–child and preschool teacher–child joint engagement was coded using simple frequency measures, each in a separate pass through the video. Language was also coded using frequency as a measure. This was done by counting whether language occurred from the child, adult, or both, within an interval of four seconds.

Behaviour or utterances that were not clear or somehow obscured were not coded. No joint attention skills were needed for the variables to be coded.

9.5.3 Positive affect

The variable for positive affect was coded for each individual in the dyads. Positive affect was operationalized to be behaviours such as smiling, laughter, clapping, etc. The coding principles for positive affect behaviours were adapted from Bloom, Beckwith, Capatides, and Hafitz (1988). Verbal utterances, such as “wow!”, “ooops!”, “oj!”, or similar utterances and exclamations with a tone of voice indicating positive affect, were also coded within this category.

9.5.4 Expansiveness

The variable expansiveness was coded whenever the child or adult in the dyad Expanded the play situation This could be done either if 1) one of the persons introduced one or more additional objects in relation to the object/event that they already were in, or 2) if the object already in focus of attention were used in new ways.

Examples:

- The child is building with LEGO®. The mother says, “are you building a garage?”
- The mother is building a garage, and the child drives a toy car into the garage

9.5.5 Change of object focus

Change of object focus was coded whenever the adult or child shifted their focus away from the shared object of attention, for example if the adult put away the object that were the focus of attention and introduced a new object, or if the child turned away and started playing with a new object, not paying any attention to the former object.

9.5.6 Language

All meaningful language that was directed towards the object of joint focus with a communicative intent was coded. This was done using frequency intervals of 4 seconds. Short utterances, such as “hmm”, “ahh”, “wiii”, etc. were not coded.

9.6 Inter-rater reliability

Two clinicians, one psychologist and one with a master in education, scored the variables positive affect, expansiveness, and change of object focus. After attaining acceptable levels of inter-observer agreement on all aspects of coding during a training period, they coded the DVD recordings in two phases. First they scored the adults’ contributions, then the children’s

contributions. 20 % of the DVDs were randomly selected for assessment of inter-rater reliability. The raters were blind to whether they were scoring mothers or preschool teachers.

A two way mixed model of intraclass correlation (ICC) was chosen for assessing reliability between the two raters, using single measures. Intraclass correlation analysis is a flexible and powerful tool for evaluating reliability (Bordens & Abbott, 2005). This type of ICC estimates the correlation between the measurements. Consistency rather than absolute agreement was chosen, as this is more appropriate considering the nature of the data (Shrout & Fleiss, 1979; McGraw & Wong, 1996). The estimates were run for adult and child in each dyad.

The inter-rater scores for adult and child positive affect reached as high as .92. See tables 9.1 and 9.2.

Intraclass Correlation Coefficient

	Intraclass Correlation[a]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.918[b]	.820	.964	23.389	23	23	.000
Average Measures	.957[c]	.901	.982	23.389	23	23	.000

Table 1.1. Intraclass correlation for adult positive affect

Intraclass Correlation Coefficient

	Intraclass Correlation[a]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.923[b]	.831	.966	25.125	23	23	.000
Average Measures	.960[c]	.908	.983	25.125	23	23	.000

Table 9.2. Intraclass correlation for child positive affect

On the variable expansiveness, the inter-rater reliability for adult estimate was approximately .82, almost the same as the child estimate (table 9.3 and table 9.4).

Intraclass Correlation Coefficient

	Intraclass Correlation[a]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.816[b]	.621	.916	9.880	23	23	.000
Average Measures	.899[c]	.766	.956	9.880	23	23	.000

Table 9.3. Intraclass correlation for adult expansiveness

Intraclass Correlation Coefficient

	Intraclass Correlation[a]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.819[b]	.626	.918	10.065	23	23	.000
Average Measures	.901[c]	.770	.957	10.065	23	23	.000

Table 9.4. Intraclass correlation for child expansiveness

The inter-rater reliability measured on the ICC for adult scores was .68 (table 9.5), whereas the inter-rater reliability for child scores reached .83 (table 9.6).

Intraclass Correlation Coefficient

	Intraclass Correlation[a]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.682[b]	.392	.849	5.294	23	23	.000
Average Measures	.811[c]	.563	.918	5.294	23	23	.000

Table 9.5. Intraclass correlation for adult change of object focus

Intraclass Correlation Coefficient

	Intraclass Correlation[a]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.826[b]	.640	.921	10.524	23	23	.000
Average Measures	.905[c]	.780	.959	10.524	23	23	.000

Table 9.6. Intraclass correlation for child change of object focus

As the tables show, the inter-rater reliability for almost all the variables was high, reaching intraclass correlations of .92 in some instances. The reliability for the coding of change of object focus in adults were however somewhat lower (approaching .70). When reviewing the data for the intraclass correlation, the somewhat lower reliability for the adult change of object focus variable, may be due to a higher range in variance within the frequency in this variable.

The language variable was coded by the author, and was not subjected to inter-rater reliability.

9.7 Data Analysis

The exploratory nature of the study favoured a correlational analysis of the data material over a regression analysis. As little is known about similarities between mothers and preschool teachers in free-play with children with autism, conducting a regression analyses was considered redundant. Regression analyses are usually conducted when one attempts to explore the relative dependency of a variable on one or more explanatory variables (Wiersma Jurs, 1998). Since no assumptions are made in the research questions about one-way causal effects, regression analyses are not conducted.

To compare the correlations on the different variables and time spent in joint engagement between the groups of mother-child and preschool teacher child, a paired samples t-test will be used since each data point in one group corresponds to a matching data point in the other group. Also since the frequency variables are on a ratio scale this is appropriate. This is also appropriate since the frequency variables are on a ratio scale.

10 Results

10.1 Research question 1:

Are there differences in duration of joint engagement between the dyads mother-child and preschool teacher-child?

Table 10.1.1 lists the time in seconds for the two dyads. As we see, the preschool teacher and child dyad spends on average approximately 320 seconds in joint engagement, compared with 281 seconds for the mother-child dyad.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Mother and Child Joint Engagement T1	53	66	535	281.43	117.517
Preschool teacher and Child Total Time Joint Engagement T1	53	61	585	319.75	134.884
Valid N (listwise)	53				

Table 10.1.1. Time spent in joint engagement, mean time in seconds

The time the two dyads spent in joint engagement will in the following be presented in percent.

The results for mean time in joint engagement are listed in figure 10.1.

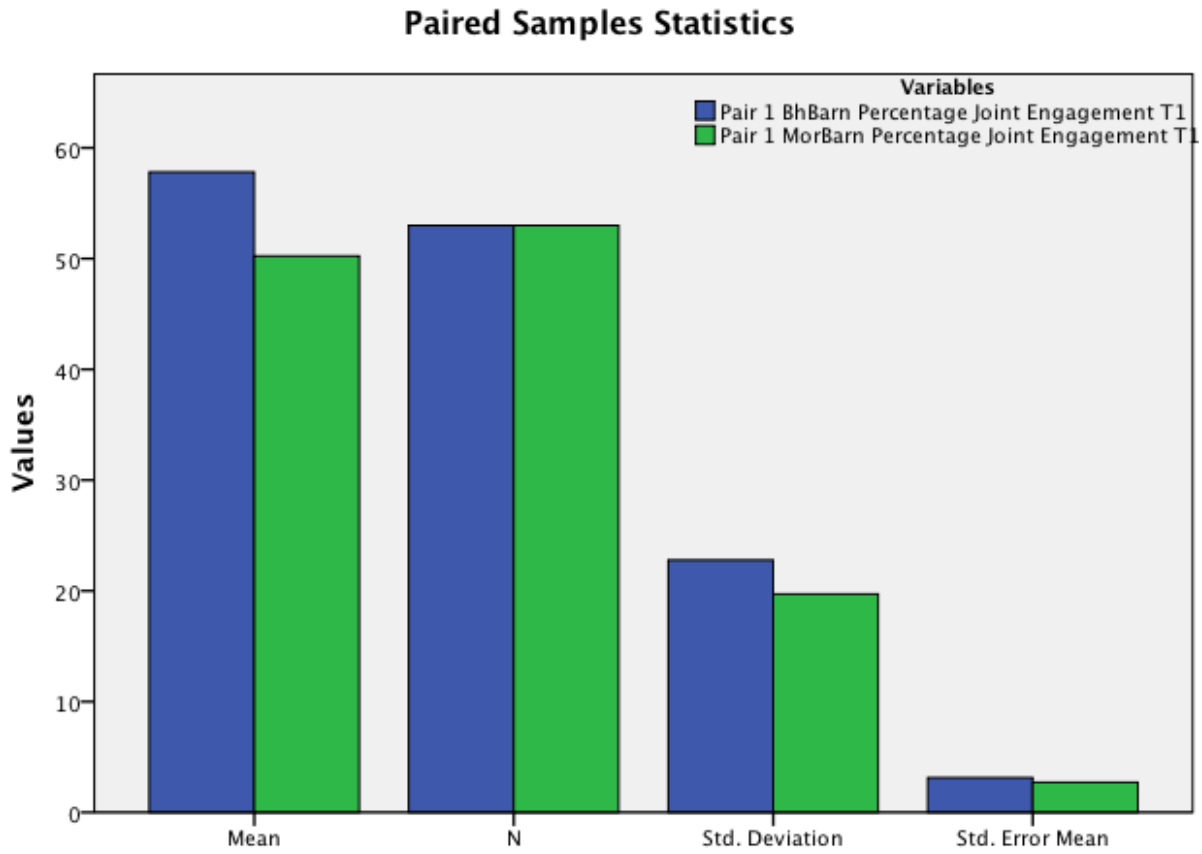


Figure 10.1. Mean percentage time in joint engagement, (N=population sample), standard deviation, and standard error mean for preschool teacher-child and mother-child dyads.

The figure above shows that the preschool teacher and child were in joint engagement for nearly 58 % of the time of the free-play recordings. On the other hand, the mother and child were in joint engagement approximately 50 % of the time. The difference between the two arithmetic means is statistically significant on a probability level of .05 (two-tailed test)

Before the sample was reduced from n= 61 to n=53, an exploratory data analysis was conducted, and a significance test of the means for the two groups were tested using both the Wilcoxon non-parametric test (because of a slight skewness in the distribution) and the paired samples t-test. Both tests showed higher significance than the t-test for the n=53 sample. This

means that subtracting the outliers from the sample did not affect the significance of the observed difference within the n=53 group in making the difference between the dyads significant. Nevertheless, there are certain elements that should be addressed concerning the accuracy of the computations.

As we see from table 10.2, the standard deviations in the two groups are somewhat different. Within the preschool teacher-child dyad the standard deviation is approximately 22.8 %. The standard deviation for the mother-child dyad is approximately 19.7 %. It should also be mentioned that the mean standard error is somewhat higher in the preschool teacher-child group (3.13) compared with the mother-child group (2.70). This means that the preschool teacher-child dyad group has a slightly greater variance on the variable of time spent in joint engagement than the mother-child dyad group

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Preschool teacher and Child Percentage Joint Engagement T1	57.8204	53	22.78900	3.13031
	Mother and Child Percentage Joint Engagement T1	50.2459	53	19.70863	2.70719

Table 10.1.2. Preschool teacher-child compared with mother-child in percentage of time spent in joint engagement. Showing mean, standard deviation, and standard error mean.

10.2 Research question 2

Are there differences in the frequency of *expansiveness, positive affect, change of object-focus*, and *language* between *and* within the dyads mother–child and preschool teacher–child when in joint engagement?

10.2.1 Positive affect, individual contributions

Looking at the individual contributions, the results for the variable positive affect show that adults and children in both dyads, on a group level, did not exceed 1 in frequency per minute. Highest were the preschool teachers with a rate of .68 for positive affect per minute, while the mothers had a rate of .63 on the positive affect variable, not a significant difference. The child group had a somewhat lower mean rate of positive affect per minute (.477 in play with preschool teachers, .555 with their mothers). Comparing mother with child and preschool teacher with child in their respective dyad did not reveal significant differences.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Preschool teacher positive affect frequency per minute	.6848	53	.63136	.08672
	Child positive affect frequency per minute with preschool teacher	.4774	53	.57082	.07841
Pair 2	Mother Positive Affect per minute	.6373	53	.79727	.10951
	Child Positive Affect per minute with mother	.5557	53	.76488	.10506

Table 10.2.1. Individual rate of positive affect per minute

10.2.2 Expansiveness, individual contributions

The frequency rates for the variable expansiveness, like the positive affect variable, did not exceed 1 per minute in any of the individuals' contributions per minute. However, the rate of expansiveness was slightly higher in all individuals compared with the positive affect rate.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Preschool teacher expansiveness per minute	.8423	53	.58924	.08094
	Child expansiveness per minute with preschool teacher	.7364	53	.43601	.05989
Pair 2	Mother Expansiveness per minute	.7024	53	.55372	.07606
	Child expansiveness per minute with mother	.6850	53	.48310	.06636

Table 10.2.2. Individual contributions of expansiveness

10.2.3 Change of object focus. Individual contributions

As evident from table10.2.3, the results for the variable "change of object focus" are somewhat different from the variables presented above. First, for this variable, the child is the one with the highest rate per minute. A frequency rate of .897 for the child when playing with the preschool teacher, who only showed .55 changes of objects per minute. In the mother-child dyads, the child on average displayed 1.15 changes of object focus compared with .679 for the mother. Second, the frequency of change of object focus for the child group is noticeably higher than for the previously presented variables.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Preschool teacher Object change Per minute	.5517	53	.34023	.04673
	Child object change per minute with preschool teacher	.8974	53	.55906	.07679
Pair 2	Mother Object change per minute	.6796	53	.52091	.07155
	Child Object change per minute with mother	1.1599	53	.76271	.10477

Table 10.2.3. Individual contributions. Change of object focus

A third aspect that deviated from the results presented above can be seen in table 10.2.4. The differences for the change of object focus variable were significant between both child and adult in both groups.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Preschool teacher Object change Per minute - Child object change per minute with preschool teacher	-.34570	.53162	.07302	-.49223	-.19917	-4.734	52	.000
Pair 2	Mother Object change per minute - Child Object change per minute with mother	-.48027	.65437	.08989	-.66064	-.29991	-5.343	52	.000

Table 10.2.4. Test of significance within the dyad for the variable change of object focus

10.2.4 Language. Individual contributions

For the variable language, the first striking difference is the deviance from the mean frequency of the other variables mentioned earlier. All individuals exceed a frequency of 1 per minute with good margin. Further, the standard deviation and standard error mean are similar in all individuals.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Preschool teacher language frequency per minute	10.8016	53	2.58978	.35573
	Child language frequency per minute with preschool teacher	4.0363	53	2.93640	.40335
Pair 2	Mother language frequency per minute	10.4408	53	2.72809	.37473
	Child language frequency per minute with mother	3.9455	53	3.29925	.45319

Table 10.2.5. Language frequency for all individuals

The differences between the child and adult in both groups are table significant (table 10.2.6). The adults have a considerably higher language frequency than the children.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Preschool teacher language frequency per minute - Child language frequency per minute with preschool teacher	6.76532	3.58988	.49311	5.77582	7.75481	13.720	52	.000
Pair 2	Mother language frequency per minute - Child language frequency per minute with mother	6.49526	3.64191	.50025	5.49143	7.49909	12.984	52	.000

Table 10.2.6. Paired difference between adult and child

10.3 The child's contribution

In this section, a paired samples t-test was computed to check for correlations and differences between how the child's frequency was when playing with its mother compared with when playing with its preschool teacher. Table 10.2.7 shows the correlations between the child's contributions across the two dyads.

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Child positive affect frequency per minute with preschool teacher & Child Positive Affect per minute with mother	53	.231	.095
Pair 2	Child expansiveness per minute with preschool teacher & Child expansiveness per minute with mother	53	.295	.032
Pair 3	Child object change per minute with preschool teacher & Child Object change per minute with mother	53	.169	.225
Pair 4	Child language frequency per minute with preschool teacher & Child language frequency per minute with mother	53	.708	.000

Table 10.2.7. Correlations between child-child on the variables positive affect, expansiveness, change of object focus, and language

As evident from the table below (table 10.2.8), there are no significant differences between the children in any of the groups except for the variable *change of object focus*. Measured on this particular variable, the child shows significantly more changing of object focus when playing with their mothers compared with playing with their preschool teachers.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Child positive affect frequency per minute with preschool teacher - Child Positive Affect per minute with mother	-.07835	.84188	.11564	-.31040	.15370	-.678	52	.501
Pair 2	Child expansiveness per minute with preschool teacher - Child expansiveness per minute with mother	.05141	.54702	.07514	-.09937	.20219	.684	52	.497
Pair 3	Child object change per minute with preschool teacher - Child Object change per minute with mother	-.26245	.86592	.11894	-.50112	-.02377	-2.207	52	.032
Pair 4	Child language frequency per minute with preschool teacher - Child language frequency per minute with mother	.09078	2.40623	.33052	-.57246	.75402	.275	52	.785

Table 10.2.8. Child contribution. For the variables: Positive affect, Expansiveness, Change of object focus, and Language

10.4 Correlation comparison between dyads

A computation was done to look for correlations across the dyads. The individual scores for each dyad were conflated into one preschool teacher–child score and one mother–child score. These were then correlated using paired sample statistics. This statistical measure was preferred and possible since the child was the same in both groups. The results for this test are listed in table 10.2.9.

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Preschool teacher and child Positive Affect Frequency for Both per minute & Mother and Child Positive Affect Frequency for Both per minute	53	.299	.030
Pair 2	Preschool teacher and child Expansiveness Frequency for Both per minute & Mother and Child Expansiveness Frequency for Both per minute	53	.433	.001
Pair 3	Preschool teacher and child Object Change Frequency for Both per minute & Mother and Child Object Change Frequency for Both per minute	53	.112	.423
Pair 4	Preschool teacher and child Language Frequency for Both per minute & Mother and Child Language Frequency for Both per minute	53	.514	.000

Table 10.2.9. Preschool teacher-Child dyad compared to Mother-Child dyad on the variables: Positive affect, expansiveness, change of object focus, and Language

As table 10.2.9 shows, there are significant correlations between the dyadic pairs on the variables positive affect, expansiveness, and language. The variable change of object focus did not correlate significantly between the dyads. This was expected, taking into account the results from tables 10.2.7 and 10.2.8. Although these findings could lead to an expectation of a significant difference on the variable *change of object focus* when conducting a paired difference test, this did not occur (table 10.2.10).

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Preschool teacher and child Positive Affect Frequency for Both per minute - Mother and Child Positive Affect Frequency for Both per minute	-.03090	1.41178	.19392	-.42003	.35824	-.159	52	.874
Pair 2	Preschool teacher and child Expansiveness Frequency for Both per minute - Mother and Child Expansiveness Frequency for Both per minute	.19127	.96630	.13273	-.07507	.45762	1.441	52	.156
Pair 3	Preschool teacher and child Object Change Frequency for Both per minute - Mother and Child Object Change Frequency for Both per minute	-.09976	1.32355	.18180	-.46457	.26506	-.549	52	.586
Pair 4	Preschool teacher and child Language Frequency for Both per minute - Mother and Child Language Frequency for Both per minute	.45162	4.49308	.61717	-.78683	1.69006	.732	52	.468

Table 10.2.10. Paired difference between dyads in the variables: Positive affect, Expansiveness, Change of object focus, and Language

All the results presented above were computed using a paired samples t-test. The results presented below will compare the mothers' and the preschool teachers' contributions on the four variables.

10.5 Independent samples t-test comparing preschool teacher with mother

Just as in the paired samples t-test, all participants having spent less than 60 seconds in joint engagement were left out of the final analyses. 59 of the preschool teachers and 54 of the

mothers met the inclusion criteria set by the author. In the following tables, preschool teachers are represented as group 1 whilst mothers are represented as group 2.

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Positive affect frequency per minute	1.00	53	.6848	.63136	.08672
	2.00	53	.6373	.79727	.10951
expansiveness per minute	1.00	53	.8423	.58924	.08094
	2.00	53	.7024	.55372	.07606
Object change Per minute	1.00	53	.5517	.34023	.04673
	2.00	53	.6796	.52091	.07155
language frequency per minute	1.00	53	10.8016	2.58978	.35573
	2.00	53	10.4408	2.72809	.37473

Table 10.2.11. Comparing preschool teachers and mothers frequency on the variables Positive affect, Expansiveness, Change of object focus and Language

Table 10.2.11 show that the mothers and preschool teachers are quite similar in their contributions when it comes to the variables at hand. None of the variables reached significance on the t-test for equality of means. However, change of object focus was approaching significance on a p-level of .05.

10.6 Research question 3:

Is there a relationship between the variables within each dyad?

For the bivariate analyses, Pearson's *r* correlations will be presented to show the relationships between the variables in the tables below. This is the measure most commonly used for data

on interval or ratio variables that are approximated by a normal distribution, and when the joint distribution is normal using a bivariate analysis. In some instances other measures are used, such as Kendall's *tau* correlation or Spearman's rank correlation coefficient. Because of a small skewness in the data, a Spearman's rank correlation was computed to check if there were any deviation from the correlations obtained using Pearson's *r*. Since the correlations were quite similar, Pearson's *r* was used due to convention.

As evident from the matrix in table 10.3.1 there were positive correlations between mother and child within all the four variables. There was also a positive correlation between the frequency of the mother's language and the child's frequency of positive affect.

	1	2	3	4	5	6	7
1 Positive affect child							
2 Expansiveness child	.21						
3 Object change child	-.02	.25					
4 Language child	.26	.27	-.06				
5Positive affect mother	**.58****	.06	-.07	-.16			
6 Expansiveness mother	.11	**.62****	.06	-.01	.00		
7 Object change mother	-.02	.03	**.54****	.04	-.21	.14	
8 Language mother	.12	**.29***	.01	**.28***	.16	.24	.01
*p<.05, **p<.01							

Table 10.3.1. Correlation between mother and child on the variables Positive affect, Expansiveness, change of object focus, and language.

The matrix showing the correlations between preschool teacher and child is listed below in table 10.3.2. Comparing the two matrices, we find that somewhat different variables correlate in the two dyads. Preschool teacher and child correlate in their frequency when it comes to expansiveness and change of object focus. The same significant correlations are found in the mother-child dyad. However, as opposed to the mother-child dyad, the preschool teacher-child group does not correlate on the variables positive affect and language. Moreover, there is a negative significant correlation between preschool teacher's frequency of positive affect and the frequency of child's expansiveness, change of object focus and language.

	1	2	3	4	5	6	7
1 Positive affect child							
2 Expansiveness child	.02						
3 Object change child	-10	.22					
4 Language child	.17	.20	.04				
5 Positive affect preschool teacher	.12	**-.27***	**-29***	**-40****			
6 Expansiveness preschool teacher	.04	**.45****	.03	.09	**-27***		
7 Object change preschool teacher	-.05	.04	**.38****	.05	-.02	.18	
8 Language preschool teacher	.00	-15	.06	.16	.16	-.06	.02
*p<.05, **p<.01							

Table 10.3.2. Correlation between preschool teacher and child on the variables Positive affect, Expansiveness, Change of object focus, and Language

Exploratory data analyses were run for the variables measuring the child's language and adult (both preschool teacher and mother) positive affect. These are presented in figures 10.2 and 10.3.

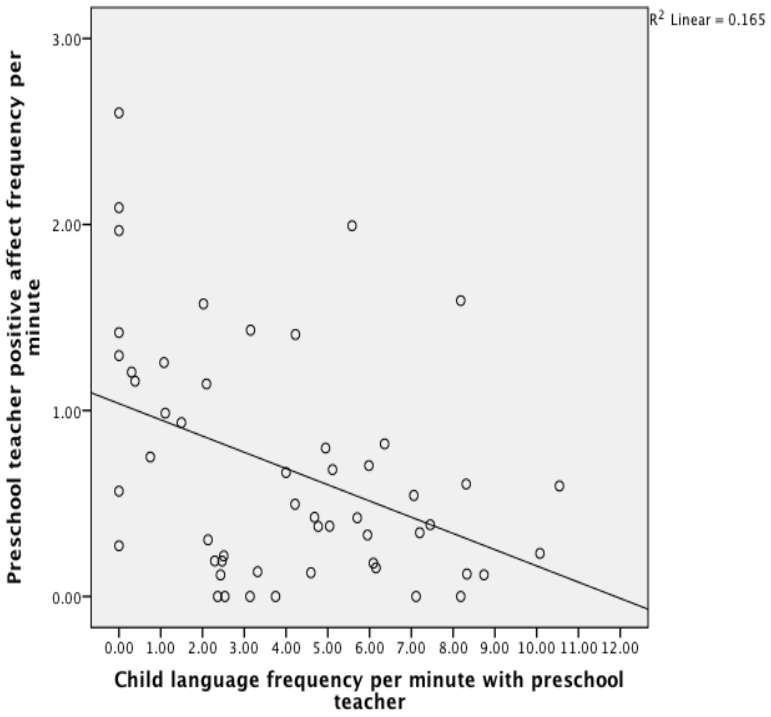


Figure 10.2. Correlation between preschool teacher positive affect and child language

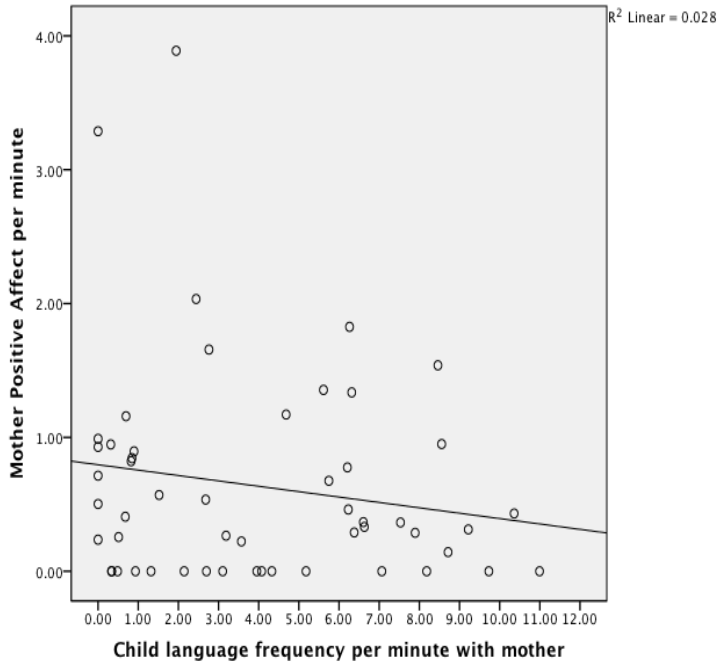


Figure 10.3. Mother positive affect contribution and child language contribution

The scatter-plots (*figures 10.2* and *10.3*) reveal that the best-fit line for the preschool teacher-child condition is steeper than what was found in the mother-child condition.

11 Discussion

A consideration of the method and methodological aspects of the thesis will be presented before the results from the study are discussed.

Second, the data from research question 1 will be discussed considering the reasons the difference in time spent in joint engagement between the two groups may imply. In relation to this research question, there will also be discussed other general factors such as mundane realism and demand characteristics which may have played a role in this particular study. Then research question 2 will be presented and seen in the light of possible reasons to why the variables were distributed as they were, considering both individual and dyadic contributions. For the third research question possible explanations will be presented for the correlations found that were found in the correlation matrices. The relation between the variables adult positive affect and child language will be discussed in depth.

11.1 Social constructs and reality

The terms discussed in this thesis are theoretical constructs. A phenomenon like joint engagement is not something that there is an exact measure of. Thus the definition of joint engagement does not ensure its existence per se. How can we be sure that two people have the exact same object in focus and, when they have this, that there is any kind of meeting of minds? As Tomasello reminds us, "how can I be sure that you know that I know that you know, and hence that we both know that we know?" (Tomasello, 2008, p. 90). Further, let us assume that two people have their focus on the same object or event, how can we be sure they are attending to the same aspects? For instance, two people looking at a ball may be interested in different things, one perhaps attending to the shape, whilst the other attending to the colour or pattern of the ball. And more difficult still, how can researchers and theoreticians claim to observe this in others?

As we see, to argue that we are certain that two persons share the same focus is not a straightforward matter. In everyday life we often encounter this problem. A teacher presenting a topic to her class may be quite confident her students are fully concentrated and attentive to what she has to say. She may also ask if they are paying attention and receive confirmative nods from around the classroom. In many situations however, the students' minds may have drifted off far beyond the classroom walls, not at all engaging in what would be characterized as a meeting of minds.

Needless to say, this makes research on joint engagement and other proximal phenomena, a difficult task, and it becomes even more complex to investigate this if one or both of the persons are children that are incapable of giving you straightforward answers when you ask them.

Even though tools for measuring for joint engagement have been refined during the past 20-30 years, there is still questions concerning how much certainty one might say to have tapped in to a child's (or adults for that matter) consciousness and hence be sure of their needs, emotions, and perhaps most of all, their intentions. This means that one can always raise the question about the inferences drawn from this kind of research about what really is going on in for instance the child's mind.

This is a discussion of methodological importance concerning aspects of epistemological realism. How can we infer that a child pointing towards some object means that this child has reached a milestone in development that tell us something about his or hers social awareness? The jump from abstract theoretical assumptions to how the phenomena actually is in the real world may seem vast in this certain example, nevertheless some assumptions are inevitable in many aspects of science, and especially this holds true in the social sciences (Kvernbekk, 2005).

As described in chapter 5, some researchers have tried to define markers that tell us something about which cognitive processes are at work. Two examples were described in depth, namely the Early Social Communication Scale (Mundy et al., 2003), and the joint engagement paradigm developed by Bakeman and Adamson (1984). Going from theoretical terminology via behaviour to making assumptions concerning social cognitive aspects seems acrobatic enough. It becomes even more interesting when we want to say something about these social cognitive aspects in relation to children that perceive the world in quite a different manner from the persons/people investigating them (i.e. researchers of development). To complicate matters even further, children with autism are different compared with children of typical development. The scientific acrobatic maneuvers needed may seem overwhelming.

However, adopting the perspective of critical realism is perhaps necessary in order to work around the aforementioned problematic issues. In such a starting point it is embedded that knowledge about the external world exists independently of subjectivity, but also that our perception is a function of and thus affected by this subjectivity (Kvernbekk, 2005).

The fact that tests such as the ESCS and the joint engagement-coding paradigm are highly correlated with other tests of social development may be used as support for a claim that the tests do say something about this kind of development. Even so, there are discussions concerning some of the inferences drawn from these tests as to what degree they measure what they intend to measure. These discussions were mentioned earlier when describing the tests and concerns when we can say for certain that the child is sharing events or objects in the way that the theoretical terms are defined.

11.2 Problems relating to the joint engagement paradigm

Many studies confirm that longer time spent in coordinated joint engagement has predictive validity for later developmental outcomes (Adamson & Bakeman, 2004; Adamson, Bakeman, & Deckner, 2009). Also the intuitive logic to this seems reasonable, the more time two persons share the same focus of attention, the higher the chance that this could be a context

leading to positive outcomes. To apply theoretical substance to this notion, these contexts can be used to spur learning within the zone of proximal development, since the contact between the two persons in the dyad is seen as reciprocal.

Often *supported* joint engagement and *coordinated* joint engagement are conflated into one broader category of joint engagement (see for instance Adamson, Deckner, & Bakeman, 2010). The same conflation of the two terms was done in this study. The reason for doing this is that the time the dyad spends in coordinated joint engagement in many instances is so short that it makes no sense using it as a singular category in statistical analyses. Specifically, this tends to occur when the sample consists of a pair made up of an adult and a child with autism.

One reason why children with autism spend less time in coordinated joint engagement compared with other children is determined by how the categories are defined. Adamson, Bakeman, Deckner, and Romski (2009) define coordinated joint engagement as when "…the child and parent are actively involved with the same referent, and the child is actively and repeatedly acknowledging the parent's participation, likely by visually referencing the parent at critical junctures in the interaction" (p. 88).

In this citation it is important to notice that in order to be classified as coordinated joint engagement, visually referencing (or similar behaviour) is one aspect that should occur. Although this is likely to be observed in typically developing children, this does not occur often when a child with autism plays with another person. Thus the coordinated joint engagement category remains displays low scores when assessing groups consisting of children with autism since children with autism have difficulties producing these kinds of behaviours (Charman, 2003).

As shown in figure 6.2 in Chapter 6 we saw that children with autism spend less time in coordinated joint engagement with another partner during a 10-minute free-play session, when compared with other groups (Adamson, Bakeman, Deckner, & Romski, 2009).

Adamson and colleagues argue that it was the early deficits in joint attention skills in the autism group that was disrupting the coordination of joint engagement. Even though the autism group spent very little time with their partners coordinating attention to a shared object, they spend a fair amount of time in supported joint engagement (Adamson, Bakeman, Deckner, & Romski, 2009). The problem arises with the fuzziness of how supported joint engagement is defined. In Bakeman and Adamsons early work (1984, 1985) they use the term *passive* joint engagement, while they in later articles call it *supported* joint engagement. In later works Bakeman and Adamson state that the usage of *passive* in this sense was unfortunate (Adamson, Bakeman, & Deckner, 2004). Whether calling it passive or supported joint engagement is not necessarily the problematic aspect of this category. The more important is the definition and what may be seen as supported joint engagement. As long as the adult focuses on the same object as the child, the latter need not do more than sometimes within a given timeframe acknowledge the other persons presence. Knowing that the asymmetry can be quite large between an adult and a child with autism in a playing situation, this may lead to much time spent in supported joint engagement as long as the adult keeps on making bids towards the child and the child's focus of attention. This may of course not be a bad thing to do as a pedagogical technique, but in many cases it does not say anything about the quality of the interaction between the two partners – which is precisely what the state supported joint engagement is supposed to do.

Because of the aspects discussed above, it is important to bear in mind that the engagement-scoring paradigm sets out to measure the abstract construct of social cognition. It may however be that we measure other aspects not exclusively relevant for the focus of the investigation. In this case we may perhaps also measure the adult's persistence and not a quality of social interaction.

11.3 Research question 1

The first research question was designed to investigate whether there were any differences in duration in the joint engagement variable between mother-child and preschool teacher-child dyads. As the results showed, there were actually differences between the two dyads. The

preschool teacher-child dyad was in joint engagement for approximately 58 % of the time. The mother-child dyad was in joint engagement around 50 % of the whole play session. This difference was significant on a .05 probability level.

One notion that perhaps seems intuitively correct from the results of the first research question is that preschool teachers and children with autism are better at playing with each other than mothers and children with autism. This would be a rather speculative claim. Even though one dyad spends more time in joint engagement, this may not capture the entire quality that makes up the whole sphere of social interactions. Therefore it would be wrong to say that one dyad is better than the other at playing together, based on differences in duration of joint engagement. This argument relates to what was discussed in the previous section considering aspects of methodology and method.

Nevertheless, many studies find that children who spend more time in joint engagement show positive outcomes in later development (Adamson, Bakkeman, Deckner, & Romski, 2009; Nelson, Adamson, & Bakeman 2008; Siller & Sigman, 2008; Tomasello & Todd, 1983). Based on this, the fact that the study at hand found a significant difference between the two dyads is quite intriguing. Some of the factors that may have led to a difference in the duration of joint engagement are discussed in the following section.

11.3.1 Mundane realism

One aspect that should be addressed to a larger extent in the research on joint engagement is the context of the test situations. Particularly when free-play is the choice of observation, the mundane reality is of importance (Bordens & Abbott, 2005). As mentioned earlier, Adamson and Bakeman (1984) assessed the amount of joint engagement between typically developing children and their mothers and peers. The context of observations was at the children's own home. This was done to facilitate mundane realism. Other studies within this particular tradition often observe the child and mother (the most common dyad investigated) playing in what might be called a clinical setting in a room, perhaps with a one-way looking glass mirror

and several cameras for recording. This can in many instances negatively affect mundane realism. The adults may feel uneasy in a situation like this. The same aspects concern the child. Specifically, this can cause problems for children with autism, as they in many cases can feel uncomfortable in new and unpredictable situations. The test situation in this particular study was at a clinic where the children in many cases were unfamiliar with the room where the play session was recorded. However this would affect the child when playing with their mothers and preschool teachers equally.

11.3.2 Adult expectation

Demand characteristics can be seen as expectancies participants have to behave in certain ways when in a research setting. Such expectancies could affect the difference found in time spent in joint engagement in this particular study. Demand characteristic is a common problem in experimental psychology. However, such effects will also occur in regular observation studies. In short, demand characteristics can change the outcome of the observations because participants will often change their behaviour to conform to what they believe is appropriate or expected of them.

In this study it might be that the preschool teachers in particular become very aware that they were being observed in a setting calling for pedagogical skills, which in turn may lead them to become quite active in supporting the child making them more persistent in taking the role as a “scaffolder”. Of course this may be true for the mothers as well, however there are differences in the expectations of a mothers role compared with the role of a preschool teacher. Following the discussion above on mundane realism, it might be that the difference between the two groups found in time spent in joint engagement would be smaller when off camera or in a different context. However, it might also be that the preschool teachers do have superior pedagogical skills leading to an actual difference in time spent in joint engagement. Using different contexts, with longitudinal designs, would be needed to investigate the findings in this study more thoroughly.

11.3.3 Adult behaviours related to duration of joint engagement

Vygotsky's view (1978) that new communication forms are first embedded in and by support in social contexts is used as a common starting point for many researchers discussing the importance of joint engagement. The importance of support and scaffolding in play with children is further emphasized in the theoretical and empirical works of Bruner (1982) and Tomasello (Carpenter, Nagell, & Tomasello, 1998; Tomasello & Todd, 1983). These researchers have argued that the most important factor for establishing and sustaining joint engagement is to follow the child's focus of attention and interests. Cognitive theories support this theoretical notion since following the child's focus of attention, and not the other way around, is seen as less demanding for the child's cognitive processing capacity.

As described in the section on children with autism and their lack of initiating joint attention and difficulties of establishing joint engagement, the need for an attentive interacting partner seems even more important than for the interaction of typically developing children. Much of the responsibility rests on the adult due to the asymmetrical form of the relationship. The fact that researchers suggest that children with autism have deficits when it comes to responding to social interactional requests adds to the interactional asymmetry. At least such responding deficits are found in children with autism up to the age of 36 months (Chawarska, Klin, & Volkmar, 2003; Nation & Penny, 2008).

In the last decade, researchers have started to investigate in more detail how adults might approach the child and be sensitive to the child's needs when participating in joint engagement. The research considering children with autism and their deficits and lack of initiation and response to social communication has been given much attention. The focus on adult contributions has in large to a large extent been overlooked (Siller & Sigman, 2002). Seen from a transactional perspective, not investigating adult contributions would leave us with an incomplete picture of important factors that need to be considered when speaking of joint engagement. Considering the example provided in chapter 3 on the child's temperament disposition and the "goodness of fit" (Thomas & Chess, 1997), one sees how important it is not to overlook transactional factors.

11.3.4 Synchronization

One factor that is of importance to the duration of joint engagement is the adult's ability to be in synchronization with the child. In fact, studies report that parents of children with autism show a remarkable ability to synchronize their behaviour in play. The parents of children with autism are just as good as parents of typically developing children when it comes to synchronizing their behaviours in accordance to the child's focus of attention (Siller & Sigman, 2002). Even though synchronization behaviours were not measured in this study, the results could give implicit support the notion that preschool teachers also have this ability, considering the time they spent in joint engagement with the child.

11.3.5 Timing

Other factors relating to synchronization may also contribute to the duration of joint engagement. One factor may be how the partners in the dyad are timing their interactional behaviours. Timing has not been investigated, but it would be interesting to look further into this aspect as a possible contributing factor. This factor, in addition to high or low synchronicity, may give useful information about interactional relationships and how they vary in dynamic quality.

11.3.6 Stimulation and regulation

In most research concerning joint engagement, the focus is on what may contribute to a longer time spent in this particular state. This is of course an important approach that needs to be investigated further since joint engagement is associated with developmental outcomes within many domains. Although researchers have focused on what may prolong time spent in joint engagement, little attention has been given to investigating what might shorten periods of joint engagement. One way of approaching this is to simply turn 180 degrees and saying that if the behaviours that prolong the state shared by the two individuals no longer occur, then

time spent in joint engagement will be shortened. However, this may not be the entire story. It may be that joint engagement could be shortened due to other factors.

Few, if any studies have focused on this aspect of joint engagement, so the following arguments are purely theoretical. Joint engagement is as repeatedly mentioned in this thesis believed to have positive developmental outcomes. Even so, it may be that this state can be exhausting for the child when it endures for a longer period of time. This can be seen in relation to emotional regulation. If an infant, typically developing or not, is stimulated for a longer period of time, the infant will look away in order to get some rest from the stimulation. The infant gets over-stimulated (Ulvund & Smith, 2004).

Taking the definition of joint engagement into account, considering how in many instances it depends upon the adult contributions, there may be times where a dyad is in supported joint engagement when the child would prefer a little less stimulation. The reasoning here is that if the child seems to withdraw from the interaction, this may, as it would be for the over-stimulated infant, be a signal to give the child a break from the supportive acts. The point is that it does not need to be negative to have shorter periods of joint engagement where this seems appropriate. When interacting with a child with autism (or any other child for that matter), it is important to take both the developmental level of the child and the signals of over-stimulation into account. It could be argued that this would lead to shorter, but qualitatively better periods of joint engagement. The aspects considering the quality versus the length of joint engagement have not been thoroughly investigated.

11.4 Summary Resarch question 1

Few if any, have reported findings between dyads in similar studies. The results showing significant difference in time spent in joint engagement is thus groundbreaking One assumption made by the author was that if there were to be a difference in time spent in joint engagement between the two dyads, this could be due to factors such as positive affect,

expansiveness, change of object focus, and language. A comparison of these variables makes up the basis for the following section relating to research question 2.

11.5 The frequency variables

Research question 2 involved the variables positive affect, expansiveness, change of object focus and language. One aim was to investigate potential differences in frequency of the variables between the two dyads. A further aim was to see if there were differences in frequency, when in joint engagement, between mothers, preschool teachers, children playing with mothers, and children playing with preschool teachers.

In this section, the four variables will be discussed separately. Then a summary of the overall findings for all four variables will be given.

11.5.1 Positive affect

For the variable positive affect, the child contributions were low. This was as expected considering that children with autism tend to show little positive affect in general (Kasari, Sigman, Mundy, & Yirmiya, 1990). Other studies reporting frequency of positive affect in children with autism show the same pattern of positive affect in social communication settings (Kim, Wigram, & Gold, 2009). Kanner, in his descriptions of a boy believed to have autism, writes "…for a time he was believed to be deaf because he did not make any change of expression when spoken to and made no attempt to speak" (Kanner, 1943, p.130). This does not mean that children with autism in general are incapable of having positive emotional states or responses. Also it is worth mentioning that there is heterogeneity within the autism group when it comes to showing positive affect when interacting socially. A more surprising result was that both preschool teachers and mothers only had a slightly higher frequency of positive affect than the children. In fact there were no significant difference between the adult contributions of positive affect compared with the contributions from the child group.

Why do the adults in dyadic interaction with a child with autism show almost the same frequency in these variables where one would perhaps expect to find a higher frequency? An analysis based on the transactional perspective reveals one possible explanation. As this perspective proposes, the adult and child will affect each other reciprocally. Therefore it may be that a child's lack of positive affect influences the adult in a way that leads to less positive affect overall in dyads where one participant is a child with autism, and of course vice versa. The results also show that the child has almost the same amount of positive affect regardless of which partner they interact with. This suggests that the child has certain characteristics and contribute to the dyad influencing the adult to behave in a certain way.

A second explanation, not mutually exclusive with the abovementioned analysis, may be that parents and preschool teachers do not regard positive affect as a way of enhancing play conditions for children with autism. Rather, aspects such as giving structure to the play sessions are seen as the more important elements when interacting with children with autism (Siller & Sigman, 2002). If this is the rationale for both preschool teacher and mother, this could be seen as the adult part of the dyad trying to adjust its play strategies to fit best with the child's needs.

This does not necessarily mean that less positive affect and expansiveness is more beneficial than the opposite. Some studies have compared adults (usually parents) playing with children with autism and adults playing with typically developing children. These studies report that the adults in the former group tend to structure the play setting by giving more directives and being more controlling (Kasari, Sigman, Mundy, & Yirmiya, 1988). It may thus be that adults playing with children with autism believe positive affect to be somewhat excessive and unnecessary. Also, giving directives and being controlling may in itself exclude the use of positive affect. Although there was no control group to compare with in the study at hand, the frequency of positive affect may be interpreted as being low, possibly for the same reasons reported by Kasari, Sigman, Mundy, and Yirmiya (1988).

11.5.2 Expansiveness

The results obtained for the variable expansiveness were very similar to what were the results from the positive affect variable. Whether or not the level of frequency is low within the child group on this variable is as for positive affect, difficult to be certain of since there were no control group to compare with. The fact that no previous studies have used expansiveness as a variable makes it even more complicated to address whether or not the frequency measured was low or not. Nevertheless, here it is supposed that the frequency distributions obtained for the child group were low, considering that children with autism often are rigid in their playing patterns. Also these children with autism have a stronger tendency to focus on one sole object compared with other children, and to be quite happy with this (Ozonoff et al., 2010).

As for the low frequencies of expansiveness shown by the two adult groups, the argument, as with positive affect, may also here be that expansiveness is not seen as a tool for enhancing play interaction. Moreover, acts of expansiveness bring more objects and/or perspectives into the play situations. The adults may see this creating more complexity, and thus loosing structure. This brings us over to yet another explanation that can be analyzed using a transactional framework.

This explanation builds on cognitive information processing theory. The rationale, which may partly explain the low frequencies, obtained for both expansiveness and positive affect. It also contributes to explain the low scores for both adults and the children. The following theoretical accounts highlight the way children with autism process information.

Many theoretical accounts suggest that autism is related to deficits in executive functioning (Háppe, Booth, Charlton, & Hughes, 2006; Pennington & Ozonoff, 1996). The theories within this tradition argue that children with autism have problems related to information processing. One perspective argues that there is a problem related to the speed of processing. Another perspective argues that it is not the speed of processing that is the problem, but rather a different way of processing perceptual stimuli than what we find in typically developing children (there are heated debates concerning this particular topic, see for instance Rajendran

& Mitchell, 2007). Whether it is a matter of speed or difference in perception is not of major importance, both perspectives agree that information processing in children with autism deviate from that of other children.

Many of the studies mentioned in the theoretical section of this thesis support deviance in processing for children with autism. Bakeman and Adamson (1984) found that children's capacity to participate in joint engagement increased systematically from 6 to 18 months. In another study they found that sharing of positive affect follows the same developmental path (1985). The same tendency was found in Scaife and Bruner's study (1975), where it was demonstrated that joint attention skills develops and is refined when the child approaches the first year of life. The pathways for children with autism do not show such patterns (Adamson, Bakeman, Deckner, & Romski, 2009). Adamson and colleagues look to Bloom and Tinker for theoretical explanations for these patterns.

Bloom and Tinker (2001) argue, in the light of cognitive processing theory. The sharing of emotions, and finding out what another person's intentions are, can be highly demanding for the processing capacity in accordance to their theoretical account. It may be that children with autism are less apt to engage with their social partners in affective interpersonal exchanges because this is so cognitively demanding, perhaps exceeding their capacities for processing information (Adamson, Bakeman, Deckner, & Romski, 2009). The low frequencies in both the positive affect and the expansiveness variables may be explained by such processing capacities.

Although there are controversies about the underlying aspects concerning the role of emotions and positive affect (see for instance Leekam, 2005), the controversial theories do not in either case exclude a processing account as the one presented here. Also the social pragmatic views emphasizing heuristics and cognitive shortcut hypotheses (Siller & Sigman, 2008) are concordant with these processing theories of autism. Also the socio-cultural perspectives such as that of Tomasello (1998), Bruner (1982; 1993), and Bakeman and Adamson (1984; 1985;

2004; 2008) often use information processing theories when explaining why adults should follow the child's focus of attention.

Following the discussion above it could be said that the adults are not displaying high frequencies of positive affect and expansiveness because they are sensitive to the child's processing capacities when engaging in affect-laden interaction. It may be that this sensitivity shown by the adults is in fact intentional. Another way of explaining this is that adults show low frequencies within these variables unintentionally. Regardless of which explanation one chooses, both give strong support for transactional reciprocity. This also underlines that it is not just the adult contributions that matter. In support of such a view is that the child, as in the positive affect variable, shows frequencies of expansiveness similar to both adults. Child characteristics play an important role influencing adult behaviours in both groups. Future research should investigate these aspects further, taking into account both child and adult characteristics.

11.5.3 Change of object focus

The results obtained from the variable *change of object focus* differ from the two variables mentioned above. For this variable the results show that the child is the one with the highest frequency. Another difference compared with the results on the variables positive affect and expansiveness is that the differences between the child and adult in both groups are significant.

One reason why the preschool teacher and mother have a lower frequency of object change per minute compared with the child, could be because they may be aware of the problems the child with autism has in changing focus of attention from one object to another. Theoretical arguments could be the same as the ones discussed in the sections above considering processing theories and socio-cultural perspectives. At least this would be the case when comparing the two adult groups. The low frequency shown by the adults on this variable could be due to the adults' wish to structure the play setting. As mentioned earlier, this

argument would be further supported if the study had a control group of adults and typically developing children showing higher frequencies of change of object focus. Nevertheless, as mentioned above, parents playing with children with autism have a tendency to structure and control play settings more than parents of typically developing children (Kasari, Sigman, Mundy, & Yirmiya, 1988). This is perhaps a good strategy since children with autism show difficulties in shifts of attention (Bainbridge Brigham, Yoder, Jarzynka, & Tapp, 2010).

It is difficult to discuss whether the results for the child's contribution for the change of object focus deviate from earlier research concerning object preference for children with autism. As described in chapter 7, children with autism in many instances show unusually sustained interest towards objects (Adamson, Deckner, & Bakeman 2010; Bainbridge Brigham, Yoder, Jarzynka, & Tapp, 2010; Williams, 2003). However, in the study at hand, and looking at the results for the whole group, the children did tend to change object focus at least once a minute. Following notions from cognitive processing theories and socio-cultural perspectives, this means that the adults should be sensitive to these shifts of attention if they want to sustain joint engagement. Put simply, the adults need to follow the child's focus of attention.

Although the same patterns of distributions of change of object focus were found when it comes to high or low distributions between adult and child groups, the most interesting difference from the other variables that needs to be addressed is that there was a significant difference between the two dyads. It seems that the mother–child group dyads tend to change objects that they are attending too more often than what is seen in the preschool teacher–child dyad.

It might be that the preschool teachers are contributing to a more structured play setting than what mothers tend to do, which in turn leads to less change of object focus for the child. However, it might also be that the child is the one behaving differently in the two dyads, and thus influences the variation in the adult contributions. The significant difference between dyads should be investigated further, perhaps looking more specifically into how preschool teachers and mothers structure play with children with autism.

11.5.4 Language

The frequency distributions for language for both adult and child group were highly different from all variables mentioned above. For all individual groups the frequency score were much higher than one per minute (child: approximately 4, adults: approximately 10). Further, the contributions made by both adult groups were significantly higher than the contribution made by the child group within both dyads.

One possible reason why the child group contributed less on this variable may be because some of the children had not developed appropriate language skills and thus would score as low as zero on this variable. This of course could obscure the language contribution pulling the mean downwards. However, taking into account the standard deviation scores, the difference within the child group evens out, and thus still gives robust significant differences. This finding is also according to in accordance with earlier described theoretical claims (Siller & Sigman, 2002; Tomasello, 2008). There was thus an expected, clear asymmetrical relationship between the adult and child in both dyads. It seems that both preschool teachers and mothers use language as a tool for scaffolding and giving structure to the play setting. Also it seems that the children use language more than positive affect, expansiveness, and change of object focus. Although language was scored in a different way, it should be safe to say that these types of acts or behaviours are the most preferred ways of sharing attention within episodes/instances/periods of joint engagement.

When looking at the results for child language contributions across dyads, there is no significant difference. The child is quite stable in its interactions with both mother and preschool teacher. In fact, the child's language seems to be the variable that shows the most stability. At a significance level of .0001, this variable correlated strongly when matching the two child conditions (.71). Again this means that the child's characteristics should be taken into account. It might be that the child's language contribution makes the adult groups more similar in frequency of language, but it might as well be the other way around.

11.5.5 Activity level

Recalling the discussion considering stimulation earlier in this chapter, it would be interesting to investigate how levels of activity from the adult partner relate to the duration of joint engagement. As research suggests, an active adult who follows the child's focus of attention plays an important role in initiating and prolonging time spent in joint engagement (Adamson, Deckner, & Bakeman, 2010). There is no reason to doubt such findings. An active adult will engage the child in play more than an inactive adult. However, we do not know for sure if adults showing high activity will contribute to a prolonged duration of joint engagement in comparison to/compared with adults that show/showing moderate activity in play with children with autism. The question that can be raised concerns whether it is aspects of quality or quantity when it comes to activity levels that are important. Are three random smiles better than one smile at a time when the child for instance looks up at the adult?

An example considering quality and quantity of the bids made by the adults can be taken from the videotapes that were the basis for the data in this project. The child is playing with a toy car. The preschool teacher watches the child and then drives another toy car towards the child's toy car. This act by the preschool teacher leads to supported joint engagement because they now have a joint focus towards the same event, the playing with toy cars. The preschool teacher then says they should build a garage, and thus expands the play setting. The preschool teacher also starts introducing small toy figures that she says can drive the cars. The child is acknowledging the preschool teachers bids and attempts to expand the game, but do not show clear signs of taking much active participation in all the new aspects of the play setting. The preschool teacher has been quite active in this section, but does not get much response to her bids. Another example considering the same dyad playing at the floor shows the child, who now has been playing with the same car for minutes. The preschool teacher did not get the child to participate in building the garage, nor was the small toy figures of any interest. The preschool teacher now does the same initial act as before. She drives the toy car over to the child's toy car. She then drives her toy car a few centimeters back and waits. Then a few seconds later, the child drives his toy car towards the preschool teacher's car. They play crashing and chasing games with the cars for quite some time.

This example can be seen in light of stimulation where the latter example is a play setting where the complexity is set at a minimum, not involving more than two objects, whereas the former example is high in complexity consisting of several objects and aspects. Also the preschool teacher gives the child the chance to respond whenever he is ready. The activity and stimulation level is set low, giving the child the time it needs to participate on its own terms. In light of cognitive theory discussed earlier, the child gets the time it needs to process the information related to the setting.

In the present study, the level of activity from both mother and preschool teacher seems to be quite similar at least for the target variables. One reason for this could be that the adults in both groups are sensitive to the child's optimal level of stimulation and thus adjusts to this level, but it might also be that the dyads would have prolonged the duration of joint engagement if there were a different activity level during these periods. These aspects should be taken into account in further investigations.

11.6 Summary research question 2

The children only acted significantly different across dyads when it came to the change of object focus variable. This variable was significantly more likely to occur when the child played with its mother than when the children played with the preschool teachers. However the overall picture, comparing the children's correlations across the two groups, shows that the children are acting quite similarly with both adult groups, not showing significant differences in any of the variables except for change of object focus.

The children's correlations across dyads can be seen as an expression of the child's stable style when in a free-play setting. This in turn might affect the approach both preschool teachers and mothers choose, which again might explain why the two adult groups to show relatively similar frequencies in positive affect, expansiveness, change of object focus, and language contributions. The similarities across the adult groups on these measures give

support to the transactional perspective. Nevertheless, the difference found in the change of object focus variable could not be explained by this approach in the same way. It might be that for this particular variable, the mothers and preschool teachers acts in different ways. One possible explanation could be that preschool teachers and mothers structure the play setting differently. This could again be hypothesized to be one of many factors to why the two dyads end up having different durations of joint engagement.

11.7 Correlations within the dyads

The target investigation for research question 3 was if there were relationships between the variables within each dyad. From the correlation comparison of the two dyads, some interesting results were obtained. The results from the correlation matrix (table 10.3.1) showed that there were significant covariance between the child and mother on the same variables (meaning that child positive affect correlated with mother positive affect and so on). All correlations were high to moderate except for language, which correlated on a lower (.28) yet significant level.

The correlations between preschool teacher and child gave a somewhat different picture (table 10.3.2). Although there were correlations between preschool teacher and child for the variables expansiveness and change of object focus, the variables for positive affect and language did not correlate.

Also deviating from the results from the mother–child group were the results for the preschool teacher–child group, where there were significant negative correlations between preschool teachers' positive affect and the child's expansiveness, change of object focus, and language. The interpretations from these findings should be discussed taking some precautionary measures, since the differences in correlation may or may not be significant when comparing

the two dyads. However when looking at the scatter-plots in figure 10.2 and 10.3, there seems to be certain trends that are not explained by chance alone.

The scatter-plots show a negative correlation between the preschool teachers' positive affect contribution and the children's language contribution. At first glance one might argue that the outliers in the scatter-plot in figure 10.2 make the regression line artificially steep. However, there are outliers distributed throughout the horizontal line, suggesting that the steepness of the regression line gives factual information about the relationship between the two variables. Furthermore the second scatter-plot, showing the relationship between mothers and children for the same variables, (*fig. 10.3*) also consists of outliers that would at the least contribute to the same amount of steepness. Thus there is good reason to believe that these two scatter-plots show that there is a significant difference between the two distributions.

The two scatter-plots tell us that preschool teachers, compared with mothers, tend to show more positive affect in play with children who have low frequencies of language. This in turn explains why there is a negative significant correlation between preschool teachers' frequency of positive affect and the child's language, a correlation that is not found within the mother-child dyad.

It is not easy to draw any inferences from these scatter-plots. One probable interpretation, however, could be that the preschool teachers use more positive affect than the mothers when interacting with children who show low frequencies of language. Since the mean frequency for preschool teacher (.68) and mother (.63) is almost identical, the steepness of the regression line for the preschool teacher–child condition supports the notion that the preschool teachers and mothers use positive affect somewhat differently. This could be because the preschool teachers and mothers initially approach the child in different ways. Another possible explanation is that certain child characteristics affect the two adult groups, making the mothers and preschool teachers act in different ways in accordance to the individual child's characteristics. Such child characteristics may be for instance the child's language level or

relate to individual developmental levels. Such characteristics were not controlled for in this particular study.

It is reasonable to assume that it is both the child characteristics and the adult approach that in transactional reciprocity lead to the differences seen in adult positive affect and child language. This could also be used as an explanation for the other significant negative correlation, i.e. between the preschool teacher positive affect and the child's expansiveness and change of object focus. Such significant correlations not present in the mother–child dyad. The correlation matrices seen together inform us that there are certain differences in how the two dyads interact. To test whether it was the adult approach or child characteristics that led to the differences mentioned above was not possible within the limits of the design chosen for this particular study.

11.8 Summary research question 3

As we see in the result section, the general tendency is that when comparing the dyads mother–child and preschool teacher–child, we find no overall significant differences in the frequencies of variables. The arithmetical mean frequencies between the dyads are almost identical in all respects. As mentioned, one reason for this similarity in mean scores may be that the same child is represented in both dyads, in practice being matched with him/herself. One could reason that the child contributes in the same manner when interacting with both mother and preschool teacher, making the dyads correlate. Seen in light of a transactional perspective, it can further be argued that the mother and preschool teacher tend to show a similar approach to playing with the child, and thus tuning in to the child's level. Most likely there is reciprocity on the interpersonal level between the dyadic partners in both groups.

11.9 Limitations of the study

As this study used a correlational design, it is difficult to draw conclusions of causation. A correlational design does not give the opportunity for causal inferences. Also, due to the lack of relevant research comparing mother–child dyads with preschool teacher–child dyads in free-play, an exploratory approach was chosen to investigate the relations between the groups. Because of this, exploration was the most appropriate approach. Although the vast majority of studies within this field employ an experimental design, correlation studies give important information about aspects that could lead to further understanding of relations such as the ones focused on in this study. A combination of such methods makes way for a better understanding of the phenomena investigated (Cronbach, 1957; 1975). The study at hand did find some interesting aspects that need further investigation, perhaps employing a longitudinal design with more exact research hypotheses.

A further limitation relating to the design of this study is that the comparison hinges on one observation for each dyad at one point in time, not making room for the possibility of trends being measured over time. This also undermines notions of transactional relationships, since the transactional perspective stresses transitions in time as an important component. As this study is part of a larger project, further investigations to how the dyads may vary in time spent in joint engagement would be interesting, and also possible. The data collected for the whole project could, since the dyads have been tested for joint engagement at four different points in time over two years, give better understanding of developmental trends that relate to joint engagement.

Yet another limitation relates to the sample at hand. In this study the groups measured Children with autism in play with a) their mother and b) their preschool teacher. A further comparison with e.g. a group of typically developing children playing with their mothers and preschool teachers, or a group with children with other developmental disorders or delays, would have given another dimension to the study

12 Concluding remarks

Socio-cultural perspectives and cognitive processing theories have been used to explain and form basis for a discussion of the results that were obtained in the present study. Both perspectives were seen in relation to each other within what was the prime theoretical backdrop in this thesis, the transactional perspective.

Most researchers within the field of childhood development acknowledge that development is a process where multiple factors are interchangeably influencing each other over time. This makes childhood development a highly complex field. Addressing this complexity, Sameroff claims that the reductionist model needs to be replaced with models taking into account this complexity. In his own words he states that "Although we have a strong desire for straightforward explanations of life, development is complicated and models for explaining it need to be complicated enough to usefully inform our understanding" (Sameroff, 2010, p. 20).

In the relatively short history of autism, dating back to Kanner's article in 1943, many suggestions about causes, possible interventions, and even cures have been suggested. Some have given valuable insights and made life easier for people who have the diagnosis and for those who in other ways are affected by it. Autism is often portrayed as a puzzle, where several pieces still are missing. There is no reason to believe that developmental aspects of autism are less complex than those in typical development.

Picture 12.1.The international symbol for autism: The puzzle ribbon.

Over the last 30 years, there has been a massive increase in the prevalence of autism. The reported prevalence in research tends to vary. This variation is for the most part explained by researchers using different inclusion and exclusion criteria when defining autism. Some researchers tend to report from the whole autism spectrum, including Asperger syndrome, pervasive developmental disorder – not otherwise specified (PDD-NOS), and what is commonly known as childhood autism, while other researchers use more fine-grained inclusion and exclusion criteria, for instance reporting prevalence for childhood autism alone. In the study at hand, the inclusion criteria were based on the diagnosis of childhood autism.

Even though there are differences in prevalence numbers for the two approaches mentioned above, the tendency shows extreme increase in prevalence in both cases (Baron-Cohen, 2008). Many suggestions have been proposed for this increase in prevalence. Some claims have been made for environmental factors such as the MMR-vaccine and mercury levels. However, such claims have not been scientifically supported. Nevertheless, environmental factors cannot entirely be ruled out (Fombonne, 2008).

The reason for the increase in prevalence of autism is most likely due to more public awareness, better screening, and a change of diagnostic criteria. Needless to say, autism is no longer viewed as a rare disorder.

Children with autism vary in different ways from typically developing children. However, there is high variability within the autism population when it comes to development, behaviour, and learning abilities. The changes in diagnostic criteria within the autism spectrum have given more room for such variability. Language delay is today not seen as crucial to get a diagnosis for childhood autism. Neither is a deviating IQ score. In fact, indications from some of the central researchers working with the forthcoming DSM-V are that IQ will play a much smaller part in the core criteria of the diagnosis (Lord & Bishop, 2010).

One of the main differences between typically developing children and children with autism relates to aspects of social interaction and communication. Looking at preliminary documents for the next edition of the DSM (the DSM-V), social interaction and communication aspects in autism will be merged into one domain called social/communication deficits (Lord & Bishop, 2010). This underlines the importance of this domain.

The proposals for the DSM-V edition highlighting social/communicative deficits show that there is a need for more research in this field. The research conducted in this thesis focuses specifically on this domain. Some studies have investigated the developmental paths of children with autism compared with children with Down's syndrome and children with typical development (Adamson, Bakeman, Deckner, & Romski, 2009). Others have investigated the role of parent contributions when playing with children with autism (Siller & Sigman, 2002; 2008). Some studies have compared play strategies between dyads consisting of parents and children with autism versus parents and children with typical development (Adamson et al., 2001). Many of these studies find that time spent in joint engagement predicts developmental outcomes at later ages.

Some general factors have been found to be of importance in prolonging the duration of joint engagement within a dyad. However, the more specific behaviours and dynamics relating to both quantity and the quality of these exchanges within joint engagement have not been thoroughly investigated. The findings in this thesis call for more research relating to factors that may contribute to prolonging joint engagement states. One interesting finding was that the preschool teacher and child spent significantly more time in joint engagement compared to the mother–child dyad. As the difference in frequency of the variables positive affect, expansiveness, change of object focus, and language seems to imply, the relationships between these factors are complex. There may be intricate factors such as the developmental level of the child that obscures the effects these variables have. It would be interesting to conduct a study where one controlled for such factors, or perhaps investigated different developmental cohorts of the autism groups. One possibility would be to investigate adult positive affect in relation to the language level of the child, as this seems to be somewhat differently distributed between mothers and preschool teachers.

A call for replication concerning the results found in this study seems appropriate. Especially it would be interesting to see if future studies supported the results relating to the significant differences in duration when comparing the two dyads. The study at hand is part of a larger research project where data are collected over four different point in time. The data used for this thesis are from the first time of testing. It will be interesting to see if the differences in the duration of joint engagement between the preschool teacher-child- and mother-child groups continue to be significantly different over time.

The findings in this study should encourage the investigation of transactions between children with autism and their interacting partners in relation to communicative development, in hope to unravel more of the intriguing social processes that is embedded in this highly complex field.

The final words I leave to perhaps the most famous person diagnosed with autism. When asked in an interview (autism-help.org., n.d.) about some fundamental aspect concerning children with autism, Professor Temple Grandin answers;

"We have got to work on keeping these children engaged with the world"

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Appendices

Coding guidelines: Engagement states

Koderegler: Mor – Barn lek

Prosjekt: Felles oppmerksomhet – Autisme, v/ Anett Kaale – dato 9/7 2008

I dette dokumentet er det redegjort for reglene for hvordan opptakene med 10 minutters lek mellom barn (B.) og mor (M.) skal kodes. Generelt er kodings-reglene hentet fra Bakeman og Adamson (1984 og 2004), men det har vært behov for noen presiseringer da ikke alt har kommet klart frem i disse artiklene. Vi har også lagt til koding av B. initiativ til felles oppmerksomhet.

Hva kodes:

1) Engagement states

2) Episoder av felles oppmerksomhet

Først kodes engagement states (hvilke states og varighet) og så kodes felles oppmerksomhet ferdighet (frekvens av de ulike FO-ferdighetene).

Varighet koding: 10:00 minutter fra start koding til slutt koding

- Start: B. og M. er begge i kamerabilde, lekene ligger på gulvet ved B./M., tester er utenfor kamerabildet, tester snakker ikke med B./M.
- Slutt: nøyaktig 10:00 min. etter start koding

Om testsituasjon er avvikende: skriv en kommentar under merknader i kodingsskjema f eks. barn gråter mye, M. mye ute av kamera …

Om det er kodet under 10:00 skriv hvorfor under merknader i kodingsskjema.

1. Engagement Stater

De 6 Engagement states (og tilleggskoder):

1. **UnE** (Unengaged): B. er ikke involvert med M., leker/objekter eller aktivitet. B. skanner rommet, går/løper rundt.

2. **OnL** (Onlooking): B. ser på hva M. gjør, men tar ikke del i aktiviteten. B. holder ikke selv på med noe objekt/aktivitet.

3. **PE** (Person Engagement): B. leker bare med M. - uten leke/objekt. For eksempel: B. koser/leker tøyselek med M. All fysisk berøring mellom M. og B. når de ikke har noe objekt kodes som PE; også når M. trekker B. frem/leier B.

4. **ObjE** (Objekt Engagement): B. leker kun med leker/objekt – ikke med M. B. oppmerksomhet er kun rettet mot leken/objektet.

5. **SuJE** (Supported Joint Engagement): B. og M. er opptatt med samme leke/objekt/hendelse, men B. viser ingen tydelig bekreftelse på M. deltakelse. B. kan være klar over at M. deltar ved for eksempel å pause slik at hun kan ta tur eller la henne sette på en kloss, men B. viser ingen vedvarende interesse mot M. – som f. eks. ved gjentatte blikk.

   Det er en markant ubalanse i interpersonlig oppmerksomhet: B. fokuserer kun på leken/objekt.

   Det kan forekomme enkeltstående henvendelser til mor (som blikk, vise ….)

   – færre enn 2 innenfor 20 sek.

   M. må være involvert i samme objekt som B. Kan være minimal involvering f eks ved at M. holde en puttekasse/gi B. en kloss eller aktiv involvering som ved at M. benevner leken/demonstrerer hvordan B. kan gjøre/klapper for B.

Min. en bid fra M. innenfor 10 sek.

Eksempler på bids fra M.:

- holder posen mens B. tar lekene ut
- tar på leken
- snakker om det B. gjør/leken B. har
- plasserer en leke foran B.

6. **CoJE** (Coordinated Joint Engagment): B. og M. er aktivt involvert med samme leke/objekt/hendelse. B. viser tydelig og flere ganger bekreftelse på M. deltakelse. B. koordinerer altså sin oppmerksomhet til både M. og leken/objekt/ hendelsen de deler. B. ser f. eks på M. og smiler før han triller ballen tilbake M. B. må vise vedvarende eller repeterende aktiv interesse mot M. – som f. eks blikkontakt.

   Det må forekomme minimum to initiativ til felles oppmerksomhet fra B. innenfor 20 sek. vinduer

   M. må være involvert I samme objekt som B. Kan være minimal involvering f eks ved at M. holde en puttekasse/gi B. en kloss eller aktiv involvering som ved at M. benevner leken/demonstrerer hvordan B. kan gjøre/klapper for B.

   Min. en bid fra M. innenfor 10 sek.

   Min. en bid fra M. innenfor 10 sek.

   Eksempler på bids fra M.:

   - holder posen mens B. tar lekene ut
   - tar på leken
   - snakker om det B. gjør/leken B. har
   - plasserer en leke foran B.

   CoJE – forutsetter både: 1) B. og M. involvert med samme leke/objekt/hendelse 2) min. 2 episoder av initiativ til felles oppmerksomhet fra B. innenfor 20 sek. vinduer.

Vi koder også:

7. **COut** (C. out of camera): Hele B. eller B. hender og ansikt er utenfor kamera. Om deler av B. er utenfor kamera, men B. hender eller ansikt er innenfor kamera vurder om du ser nok til å kode.

8. **MOut** (M. out of camera): Hele M. eller M. hender og ansikt er utenfor kamera. Om deler av M. er utenfor kamera, men M. hender eller ansikt er innenfor kamera vurder om du ser nok til å kode.

9. **TI** (Tester interruption): Tester er i kamera, tester snakker med M. eller B. Om kun en liten del av testers arm, kne … er i kamera vurder om du ser nok til å kode.

Om flere av tilleggskodene (7, 8 og 9) forekommer samtidig – bruk den som startet først.

Husk 3 sek. regelen også for kodene 7-9.

Se artikkelen til Bakeman og Adamson (1984) og Adamson, Bakeman og Deckner (2004) for ytterligere beskrivelse av de 6 engagement states.

Generelle regler koding av engagement states:

- Engagement states er kontinuerlig og mutually exclusive

- 3 sek. regel for en ny state = en state må vare minimum 3 sek. for å defineres som en ny state.

- 20 sek. regel for CoJE = det må være minimum 2 episoder av felles oppmerksomhet innenfor 20 sek. for at staten skal vurderes som CoJE – om det er færre kodes det som SuJE.

- 10 sek. regel for bid fra mor = mor må minimum ha 1 bid pr 10. sek. for at staten skal vurderes som SuJE/CoJE.

- Koder fram: hvis det er en kort episode (under 3 sek.) med en annen state, skal den kodes sammen med den state som kommer etter den.

PE UnE ObE

7 sek. ~~+ 2~~ 2 sek. 6 sek. **+ 2**

- B. snakker om leke/objekt men tar ikke på leke/objekt og M. er ikke opptatt av samme leke/objekt – kodes som UE (unengaged)

- B. og M. snakker sammen om noe utenfor testrommet – kodes som unengage

- B. og M. snakker sammen om noe i tetsrommet, men de leker ikke med leken – kode som unengage (litt rart, men det blir slik fordi vi ikke koder språk)

- B. ser på M. og snakker om det M. gjør – kode som OnL.

- B. har ingen leke/objekt i hånden, men sitter kun å ser på en ikke aktiv leke – kodes som UE (unengage).

- Om B. kun sitter å ser på en aktiv leke (f. eks en bil som kjører) – kodes som ObE.

2. Episoder av felles oppmerksomhet

De 4 Felles oppmerksomhetsferdigheter som kodes:

1. **Alternere blikk**: B. ser fra leke/objekt til M. øyne. B. blikk må være rettet mot øvre del av M. ansikt. M. må ikke se på/være interessert i objektet. Skår en gang for hver gang B. ser fra en leke/objekt til M. øyne**.**
   Ikke kode: om B. ser på M. for å be om hjelp (f. eks. for å få hjelp til å åpne noe eller sette noe i gang)

2. **Vise:** B. løfter en leke opp og mot M. øyne. B. holder leken relativt stille i min. 1. sek. Vise er lett å blande med gi - om ikke barnet vil gi fra seg leken - skår da som vise. Skåres ikke om M. spør om å få se.

3. **Peke:** B. peker med utstrakt pekefinger og de andre fingrene bøyet nedover (tydelig pekegest) mot en leke/objekt. Det er ikke nok om B. bare dytter/tar borti leken med en finger. Skåres ikke om M. peker på leken/objektet først og B. peker på den samme leken/objektet rett etterpå.
   Ikke kode: om B. peker på noe for at M. skal gi det til han/henne eller for å få hjelp til noe (for eks. for at M. skal gi det en leke som er utenfor rekkevidde)

4. **Gi for å dele/vise:** B. gir en leke/objekt til M. for å la M. få den/B. gir en leke/objekt til M. for å vise. B. retter oppmerksomheten mot M. mens M. ser på leken/objektet. B. får så leken tilbake av M. Skårer ikke om M. spør om å få/låne eller om M. spør om å få se.
   Ikke kode: om B. gir noe til M. for å få hjelp (for eks. for å få hjelp til å åpne noe eller sette noe i gang)

Generelle regler for koding av episoder av felles oppmerksomhet:

- Episoder av felles oppmerksomhet – forutsetter triangulering: barn, mamma og leke/objekt/hendelse. B. deler oppmerksomhet om leke/objekt med M.

- Vi koder kun B. initiativ til felles oppmerksomhet – ikke B. respons på felles oppmerksomhet.

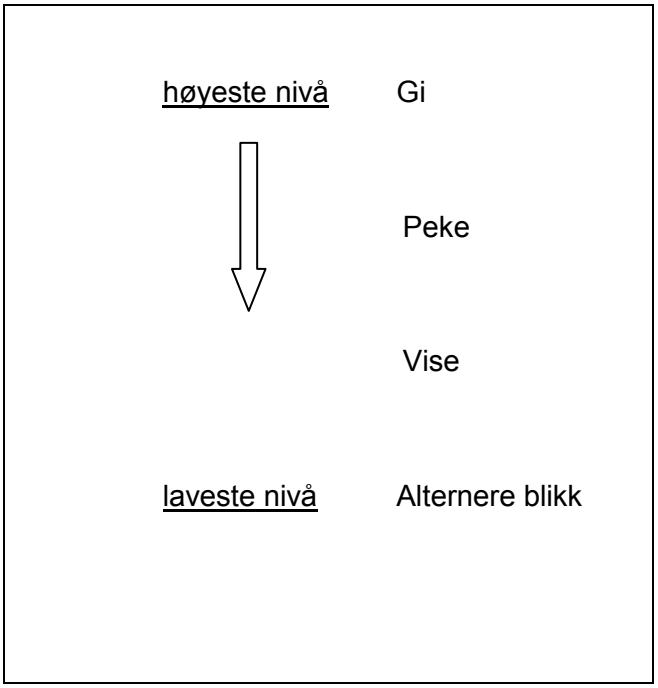
- M. trenger ikke være opptatt med den samme leke/objekt/hendelse som B. for å kode felles oppmerksomhet

- Felles oppmerksomhet skilles fra atferdsregulering
  a. Vi koder alternering av blikk, vise, peke og gi når barnet gjør dette kun for å dele oppmerksomhet med M. – da dette er felles oppmerksomhet
  b. vi koder ikke peke, gi, vise og alternering av blikk når barnet gjør dette for å få eller for å oppnå noe - da dette er atferdsregulering

- Vi skiller altså mellom blikk, vise, peke og gi for felles oppmerksomhet og de samme ferdighetene brukt som atferdsregulering (for å få/oppnå noe) – atferdsregulering skåres ikke

- Om to felles oppmerksomhetsferdigheter forekommer samtidig – skårer den som er på det høyeste nivået. Vi skårer for eksempel Gi hvis Gi og Alternering av blikk forekommer samtidig. I

Nivåer av felles oppmerksomhet:



- Vi koder konservativt = hvis vi ikke er sikker på om det er en episode av felles oppmerksomhet, skåres det ikke.

- Det kreves ikke at B. ser på (blikkontakt) M. for å skåre felles oppmerksomhets-ferdighetene (vise, peke, gi for å dele/vise kan forekomme uten blikk fra B.)

- Ikke kode felles oppmerksomhet (f eks gi om B. gir M. en leke som M. spør etter/spør om å få (dette er respons ikke initiativ fra B.)

- **Smil/latter**: vi koder ikke smil/latter (smil/latter kan derimot hjelpe oss til å fastslå om det er FO, om B. f. eks ser fra leke til M. og samtidig smiler mot M. styrker det antagelsen om at det er FO)

- **Språk**: vi koder ikke språk (språk kan derimot hjelpe oss til å fastslå om det er FO, om barnet for eksempel snakker om en leke samtidig holder den opp foran M. styrker det antagelsen om at det er FO)

- B. peker eller alternerer blikk, men objektet er utenfor testrommet (ut vinduet) – kodes ikke.

- Kaste ball er ikke gi for å dele – kodes ikke

Coding Guidelines: Positive affect, expansiveness, and change of object focus

Kodingsregler

Utviklet av Anders Nordahl Hansen og Anett Kaale

11.03.2010

Variabler som skal kodes:

Variabel 1: Positiv affekt

Dette er en variabel som fanger opp de emosjonelle bidrag fra hvert individ i samspillsdyaden. Dette kan være 1) atferd i form av smil, latter, klapping o.l (atferd) eller 2) verbale ytringer som ”oj” ”ooopps” ”wow” eller andre ytringer som har et toneleie som indikerer klar positiv affekt som for eksempel ”Se på den da du!” ”Åååå så fin!” eller ”neeiii!”.

Variabel 2: Expansiveness:

Dette er en variabel som dreier seg om utvidelse av lek. Dette kan foregå ved 1) at et eller flere nye objekter innføres i sammenheng med det/de objektene som allerede er i bruk eller 2) at det/de objektene som allerede er i bruk benyttes på en ny måte.

Variabel 3: Skifte av objektfokus:

Hver gang den voksne eller barnet bytter fokus bort fra den/de objekter de holder på med til et nytt objekt skal det settes et kryss for ”skifte av objektfokus”.

Generelle koderegler:

Følgende regler gjelder for alle de tre variablene som skal kodes:

Barn og voksne skal kodes separat. Hver dvd skal derfor ses på to ganger - den voksnes bidrag kodes ved første gjennomgang, så barnets bidrag ved andre gjennomspilling.

Om en atferd eller ytring ikke er klar og tydelig skal den ikke kodes. Kodes uklar atferd eller ytringer vil dette kunne påvirke reliabilitet og validiteten negativt.

For at en og samme variabel skal få et nytt kryss må det være en pause på minimum 2 sekunder før den samme variabel skal kodes igjen. Dette gjelder ikke hvis det er to forskjellige variabler som forekommer innen en 2 sekunders periode.

Eksempel: 1) Barnet smiler og ler innen en periode som strekker seg fra 02.43-02.45→kodes kun som et kryss på positiv affekt til barnet 2) Barnet smiler og skifter objektfokus i en periode som strekker seg fra 02.43-02.45→ kodes som ett kryss på positiv affekt og ett kryss på skifte av objektfokus.

Atferd eller ytringer som er helt eller delvis skjult (som ved for eksempel dårlig kameravinkling) skal ikke kodes, med mindre kodere er sikre på at atferden/ytringen har funnet sted. For eksempel ved at man hører klar og tydelig latter fra en av partene uten å se direkte at vedkommende ler.

Det er ikke nødvendig med blikkveksling eller at samspillspartnerne ser på hverandre for at en skal kode en atferd/ytring. I mange tilfeller vil det se ut som om det ikke er noe særlig samspill eller erkjennelse av dens andre tilstedeværelse. Dette er uviktig i denne sammenheng.

Eksempel:

- Barnet sitter og leker med en leke og ser ned på leken og smiler→kodes som affekt
- Barnet lager tårn og tårnet faller og barnet roper ”oj” uten å virke opptatt av den voksne→ kodes som affekt

På nester side følger en utvidet beskrivelse av de tre variablene med eksempler

VARIABEL 1: POSITIV AFFEKT

Atferd av tydelig positiv affektiv karakter som smil, latter og excitement og affektive ytringer skal kodes. Det settes et kryss i kodingsskjema hver gang følgende atferd forekommer:

Smil: tydelig smil (munnviker trukket ut til sidene eller oppover). NB! Ofte kan smil komme raskt og flyktig. Derfor kan det i visse tilfeller være nyttig å se på filmen i ½ eller ¼ hastighet.

Latter: Alt fra kort til lengre varig latter.

Excitement: Gester og kroppsspråk som er av tydelig emosjonell art eller en oppspilthet som er klart positivt affektiv som for eksempel klapping, high five og lignende. Det skal også kodes for overraskelse som for eksempel ved at øyne sperres opp eller håndbevegelser som tyder på en oppspilthet. Det skal derimot ikke kodes om personen blir skremt og uttrykker negativ affektiv overraskelse.

Affektive ytringer: Setninger og korte utrop som ”Oj”, ”Nææh”, ”Oooppsss” ”Yeaaah” osv. Et eksempel kan være når de har bygget et tårn med klosser og det faller, og en av personene utroper ”Åhhh, der falt den”, eller bare ”Åhhh” med overraskende trykk. Hvorvidt dette er en affektiv ytring vil vise seg i toneleie og intonasjon. Den voksne vil ofte benytte seg av affektive ytringer for eksempel når en ny leke introduseres og da si ”Se på den her da!” eller når barnet har bygget noe fint og den voksne sier ”Så fiiint!” med opphevet toneleie. Noen ganger vil slike affektive ytringer kunne virke noe oppkonstruert og litt unaturlig; de skal likevel kodes.

Generelle regler for koding av positiv affekt

Hver gang en positiv affektiv atferd/ytring forekommer skal det settes et kryss. Det er kun positiv affekt som skal kodes, ikke negativ affekt, som når barnet for eksempel gråter, eller barn/voksen viser andre typer negativ affekt. Affektnøytrale tilstander skal heller ikke kodes. NB: Merk at også overraskelse i form av utrop og gester kan være positiv affekt.

Det skal kodes for affekt selv om affekt atferden kan virke påtatt. (Merk og at barna kan virke noe rigide i sin positive affekt).

Noen affekt-uttrykk kan være ganske korte i form (eks. et raskt smil, eller et kort utrop), disse skal kodes uansett hvor kort varighet det er. For at det skal registreres et kryss for ny positiv affekt må det være en pause i den affektive atferden/ytringen på minimum 2 sekunder.

I visse tilfeller vil affektiv uttrykk vedvare over lengre tid. For eksempel ved latter, smil som varer i 10 sekunder, eller affektive ytringer som varer over lengre tid. I tilfeller der affekt vedvarer over tid, skal dette kun kodes som en episode av affekt (med mindre det er pause i affekt-atferd/ytring på mer enn 2 sekunder).

Når affektiv atferd eller affektive ytringer forekommer på samme tidspunkt eller overlapper, skal dette kodes som èn episode av affekt – med kun et kryss i kodingsskjema..

Eksempler: a) mor smiler og sier ”åå så flink”→ kodes som ett kryss på affekt b) barnet ler og mens det fortsatt ler klapper det begeistret i hendene→ kodes som ett kryss på affekt

Følgende skal ikke kodes:

1) Det skal ikke kodes for affektive ytringer om personene snakker om affekt. For eksempel hvis mor sier ”du er så glad i dag” eller barnet sier ”jenta er glad”, med mindre dette gjøres affektivt for eksempel med positivt toneleie. Altså skal ikke beskrivelser av affekt skåres med mindre de formidles affektivt.

2) Det skal ikke kodes for affekt om voksen/barn viser affekt i form av smil, latter eller affektive ytringer rettet mot andre personer i rommet.

VARIABEL 2- EXPANSIVENESS:

Expansiveness atferd/ytringer i form av ny bruk av samme objekt, innføring av nye objekter og verbal utvidelse av lek skal kodes. Det settes et kryss i kodingsskjema hver gang følgende atferd forekommer:

Expansiveness - ny bruk av samme objekt:

Det skal gis et kryss for expansiveness når et objekt lekes med på en ny måte som er tydelig forskjellig fra den foregående måten å leke med objektet på. Det skal gis et nytt kryss for hver gang et objekt blir benyttet på en ny måte. Dette innebærer både ulike måter å håndtere objektene på (atferd), men også ting som sies (ytringer) fra den voksne eller barnet, som tilsier at leken/lekenes premisser endres. Det skal IKKE kodes expansiveness hvis en av partene kun beskriver objekter. For eksempel utsagn som "Det var en fin blå bil" når de holder på med bilen, eller "denne mobilen spiller fin musikk" hvis mobilen spiller musikk.

Eksempler på ny bruk av samme objekt:

- Barnet leker med dukken, den voksne sier "nå er dukken trøtt og vil legge seg".
- Den voksne og barnet bygger med klosser og en av partene sier "blir det et tårn?"
- Barnet sitter og leker med klinkekuler, så sier den voksne "se på det fine mønsteret inne i klinkekulene".
- Den voksne holder en bok foran barnet, barnet tar så boken og begynner å bla i den.

Expansiveness - innføring av nye objekter:

Det skal kodes et kryss når leken blir utvidet fra å dreie seg om et objekt til at også et eller flere nye objekter blir innført i tillegg til det første. For hver gang et nytt objekt blir innført på denne måte skal det gis et kryss.

Eksempler på innføring av nytt/nye objekter:

- Den voksne kjører med lekebilen og barnet tar en duplofigur og setter den oppå bilen→ barnet får kryss
- Barnet leker med trappetrollet, så tar den voksne en ball og trer ballen gjennom trappetrollet→ den voksne får kryss

Expansiveness – verbal utvidelse av lek:

Hvis barnet/den voksne verbalt innfører et eller flere nye temaer i den gjeldene leken skal dette kodes som expansiveness.

Eksempler på verbal utvidelse av lek:

- Barnet kjører rundt med lekebil, den voksne *sier* (ytring) at de kan lage garasje til bilen→den voksne får kryss
- Den voksne holder på en liten lekeseng. Barnet sier ”nå skal dukken sove i sengen”→barnet får kryss

Generelle regler for koding av expansiveness

Hver gang expansiveness i form av enten en atferd eller en ytringer forekommer, skal det kodes som ett kryss i skjemaet. All expansiveness atferder eller ytringer fra barnet/den voksne skal kodes. *Merk at* dette gjelder også hvis atferden eller ytringen er en respons på noe den andre lekeparten har sagt eller gjort.

Eksempel: den voksne og barnet kjører bilen frem og tilbake midt på gulvet, den voksne sier ”så kan bilen kjøre inn i garasjen” (=et kryss til den voksne), barnet kjører så bilen inn i en åpen firkant av duploklosser som representerer garasjen (=et kryss til barnet)

Når expansiveness atferd og ytringer forekommer samtidig eller overlapper skal det kun krysses av èn gang.

VARIABEL 3 - SKIFTE AV OBJEKTFOKUS:

Hver gang den voksne eller barnet bytter fokus fra det/de objekter de holder på med til et nytt objekt skal det settes et kryss for ”skifte av objektfokus”. Forutsetningen for å få et kryss her er at den som tar et nytt objekt da fullstendig slipper fokuset på det objektet de nylig hadde i fokus. Det er den person som tar et nytt objekt og bytter fokus bort fra det/de objekter de holder på med som skal få et kryss for ”Skifte av objektfokus”.

”Skifte av objektfokus” skal kodes fra 2 sekunder ut i perioden til periodens slutt. Starter perioden på tidspunkt 02.42 og slutter på 02.58 skal det kodes ”skifte av objektfokus fra 02.44 til periodens slutt på 02.58.

For at det skal registreres et kryss for ”skifte av objektfokus” må det være en pause på minimum 2 sekunder fra de sist skiftet leke.

En del objekter som brukes i testsituasjonen består av flere deler, som for eksempel klossene og duplofigurene. Enkeltdelene regnes da ikke som ulike objekter, men som EN leke/objekt. For eksempel regnes alle klossene som en og samme leke/objekt. Barnet/den voksne vil derfor ikke få kryss om de veksler fra å bruke en kloss til å bruke en annen kloss. Lekene/objektene som regnes som en leke/objekt er som følger:

- Mobiltelefoner (2 stk.)
- Trappetroll (2 stk.)
- Byggeklosser av tre
- Duplo klosser
- Klinkekuler
- Plastposer
- Koppesett

Eksempler på skifte av objektfokus:

- Voksen og barn sitter og leker sammen med klossene. Barnet tar så en bil og mister helt fokus på klossene som de holdt på med. Det nye objektet er altså ikke en videreutvikling av leken med klossene. Barnet fjerner seg altså fra objektet de hadde felles, for så å ta et nytt objekt som ikke benyttes som en utvidelse av lek (=barnet får et kryss for ”skifte av objektfokus”).
- Den voksne og barnet sitter og leker med et objekt eller en hendelse. Den voksne bryter ut av denne leken og tar heller fram et nytt objekt som ikke brukes i sammen med det foregående objektet (den voksne får et kryss for ”skifte av objektfokus”).

Coding guidelines: Language

Kodingsregler - Verbale ytringer

Utviklet av Anders Nordahl Hansen

Tidsintervallkoding av verbale ytringer:

Alle felles engasjement periodene (både coordinated og supperted joint engagement perioder) deles opp i 4 sekunders-intervaller. Forekomst av verbale ytringer fra barnet eller den voksne innenfor hvert av disse 4-sekundersintervall kodes ved å sette et kryss. Det settes separate kryss for ytringer fra barnet og den voksne.

Det settes maksimum ett kryss innenfor hvert intervall for hver uavhengig av lengde på ytringen og type ytring.

Verbale ytringer kodes for voksen og barn i en og samme gjennomstrømning.

Hvilke verbale ytringer skal kodes:

Alle ytringer, som setninger, enkelt ord eller utrop, som for eksempel ”Ahh”, ”Oops”, ”Swisj”, ”Bruumm bruuuum”, ”Åhh”, skal kodes.

- Det skal ikke kodes for gråt
- Det skal ikke kodes for latter.
- Det skal ikke kodes hvis barnet eller den voksne snakker til andre personer i rommet (som for eksempel testleder).

Om det er uklart om en verbal ytring har funnet sted, skal den ikke kodes.

Utdypninger:

Det er ikke nødvendig med blikkveksling eller at samspillspartnerne ser på hverandre for at en skal kode en verbal ytring. I mange tilfeller vil det se ut som om det ikke er noe særlig samspill eller erkjennelse av dens andre tilstedeværelse. Dette er uviktig i denne sammenheng.

Første 4 sekunders intervall innenfor hver felles engasjementperiode starter samtidig med oppstart av felles engasjementperioden.

Supported joint engagement og coordinated joint engagement regnes som jevnbyrdige. Det er følgelig ikke noen forskjell på hvordan disse kodes. Der den ene av disse påfølges av den andre vil dette kodes som én episode.

Der det for eksempel er 10 sekunder med felles engasjement som skal kodes vil det bli 2 vinduer á 4 sekunder som kodes pluss ett vindu med 2 sekunder 4+4+2=10.

Intervaller som er kortere enn 4 sekunder, enten fordi de kommer helt på slutten av en felles engasjementperioden eller innenfor en felles engasjementperiode som er < 4 sekunder, kodes på vanlig måte. Altså, forekommer det en verbal ytring innenfor et slikt kort intervall settes det kryss for den som kom med ytringer.

Kodingen foretas på et papirskjema med blyant.

Skjemaet inneholder en loddrett kolonne med de ulike felles engasjementsperiodene. Det skal kodes i form av et kryss for hver 4 sekunders vindu. For hvert 4 sekunders vindu skal det kodes både for den voksnes verbale ytringer og barnets verbale ytringer. Dette vil si at for hvert 4 sekunders vindu vil det være mulig at både den voksne og barnet får et kryss hver, eller at bare en av de to får det, eller at ingen av de to får kryss.

Skjemaet vil være likt det som er blitt benyttet på kodene positiv affekt, expansiveness, skifte av objektfokus, men kun med ”verbal ytring voksen” og ”verbal ytring barn” istedenfor.